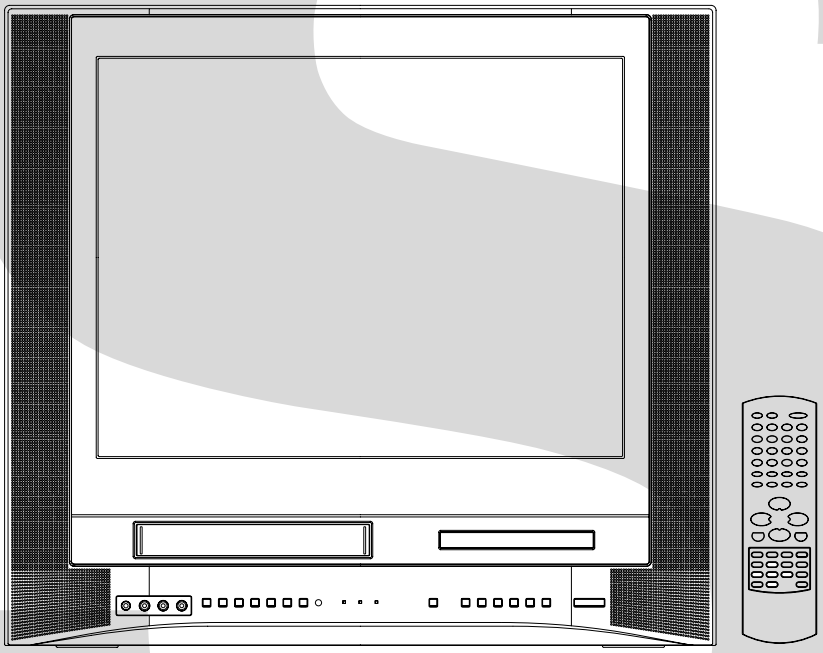
TOSHIBA

FILE NO. 140-200322

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER/ DVD VIDEO PLAYER

MW20FN1R



DOCUMENT CREATED IN JAPAN, Jun., 2003

CAUTION

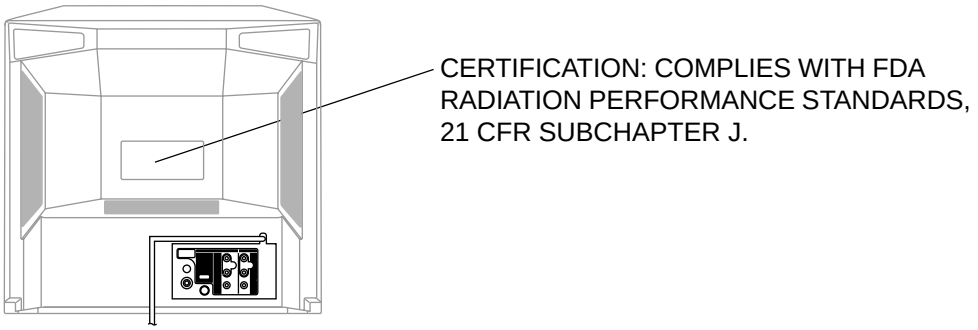
THIS DIGITAL VIDEO PLAYER EMPLOYS A LASER SYSTEM.

TO ENSURE PROPER USE OF THIS PRODUCT, PLEASE READ THIS SERVICE MANUAL CAREFULLY AND RETAIN FOR FUTURE REFERENCE. SHOULD THE UNIT REQUIRE MAINTENANCE, CONTACT AN AUTHORIZED SERVICE LOCATION-SEE SERVICE PROCEDURE.

USE OF CONTROLS, ADJUSTMENTS OR THE PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

TO PREVENT DIRECT EXPOSURE TO LASER BEAM, DO NOT TRY TO OPEN THE ENCLOSURE. VISIBLE LASER RADIATION MAY BE PRESENT WHEN THE ENCLOSURE IS OPENED. DO NOT STARE INTO BEAM.

Location of the required Marking
The rating sheet and the safety caution are on the rear of the unit.



SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IMPORTANT SAFEGUARDS

1. **READ INSTRUCTIONS**
   All the safety and operating instructions should be read before the unit is operated.
2. **RETAIN INSTRUCTIONS**
   The safety and operating instructions should be retained for future reference.
3. **HEED WARNINGS**
   All warnings on the unit and in the operating instructions should be adhered to.
4. **FOLLOW INSTRUCTIONS**
   All operating and use instructions should be followed.
5. **CLEANING**
   Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6. **ATTACHMENTS**
   Do not use attachments not recommended by the unit's manufacturer as they may cause hazards.
7. **WATER AND MOISTURE**
   Do not use this unit near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
8. **ACCESSORIES**
   Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury, and serious damage to the unit. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer.

PORTABLE CART WARNING
(symbol provided by RETAC)

S3126A

8A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9. **VENTILATION**
   Slots and openings in the cabinet and in the back or bottom are provided for ventilation, to ensure reliable operation of the unit, and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the unit on a bed, sofa, rug, or other similar surface. This unit should never be placed near or over a radiator or heat source. This unit should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
10. **POWER SOURCES**
    This unit should be operated only from the type of power source indicated on the rating plate. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.
11. **GROUNDING OR POLARIZATION**
    This unit is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. If your unit is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin, this plug will only fit into a grounding-type power outlet. This too, is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
12. **POWER-CORD PROTECTION**
    Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. **LIGHTNING**
    To protect your unit from a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.
14. **POWER LINES**
    An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.
15. **OVERLOADING**
    Do not overload wall outlets and extension cords, as this can result in a risk of fire or electric shock.
16. **OBJECT AND LIQUID ENTRY**
    Do not push objects through any openings in this unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill or spray any type of liquid into the unit.
17. **OUTDOOR ANTENNA GROUNDING**
    If an outside antenna or cable system is connected to the unit, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
18. **SERVICING**
    Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

19. DAMAGE REQUIRING SERVICE

Unplug this unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power-supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the unit.
c. If the unit has been exposed to rain or water.
d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
e. If the unit has been dropped or the cabinet has been damaged.
f. When the unit exhibits a distinct change in performance, this indicates a need for service.

20. REPLACEMENT PARTS

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or those that have the same characteristics as the original parts.
Unauthorized substitutions may result in fire, electric shock or other hazards.

21. SAFETY CHECK

Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

22. WALL OR CEILING MOUNTING

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

23. HEAT

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

24. DISC TRAY

Keep your fingers well clear of the disc tray as it is closing. It may cause serious personal injury.

25. CONNECTING

When you connect the product to other equipment, turn off the power and unplug all of the equipment from the wall outlet. Failure to do so may cause an electric shock and serious personal injury. Read the owner's manual of the other equipment carefully and follow the instructions when making any connections.

26. SOUND VOLUME

Reduce the volume to the minimum level before you turn on the product. Otherwise, sudden high volume sound may cause hearing or speaker damage.

27. SOUND DISTORTION

Do not allow the product output distorted sound for a longtime. It may cause speaker overheating and fire.

28. HEADPHONES

When you use the headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

29. LASER BEAM

Do not look into the opening of the disc tray or ventilation opening of the product to see the source of the laser beam. It may cause sight damage.

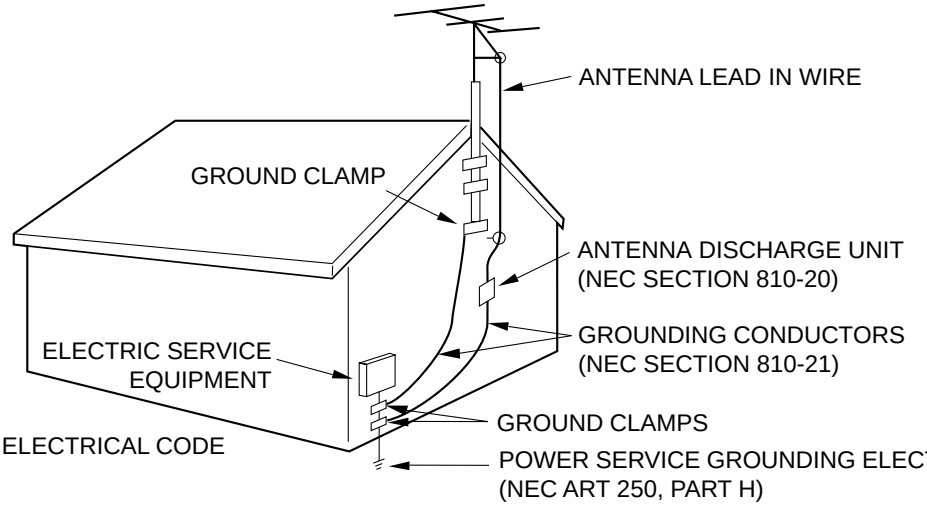
30. DISC

Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.

31. NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

EXAMPLE OF ANTENNA GROUNDING AS PER THE NATIONAL ELECTRICAL CODE



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TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the TV/DVD/VCR block from the main unit and the **Fig. 1** below can be seen. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Remove one screw of the Loading Motor from the insert hole for screw driver and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape. **(Refer to Fig. 2)**
4. Rotate the Clutch Ass'y either of the directions to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch on the tape.

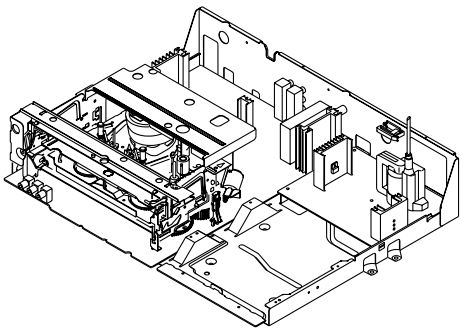

Fig. 1

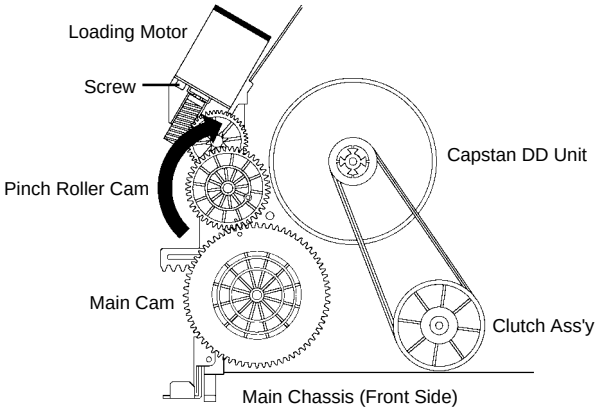

Fig. 2

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Back Cabinet, TV//DVD/VCR Block and DVD TOP. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Slide the Rack Loading (White) toward the arrow direction by using a minus driver to release the lock. **(Refer to Fig. 1)**
3. Draw the Tray.

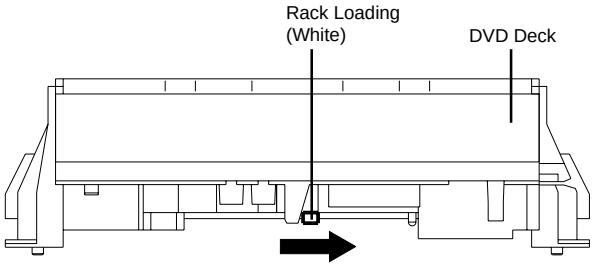

Fig. 1

PARENTAL CONTROL - RATING LEVEL

4 DIGIT PASSWORD CANCELLATION

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Press and hold the 'STOP' key on the front panel.
3. Simultaneously press and hold the '7' key on the remote control unit.
4. Hold both keys for more than 3 seconds.
5. The On Screen Display message 'PASSWORD CLEAR' will appear.
6. The 4 digit password has now been cleared.

TRAY LOCK

Tray cannot be opened by setting the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Press and hold the '9' key on the remote control unit.
4. Simultaneously press and hold the 'STOP' key on the front panel.
5. Hold both keys for more than 3 seconds.
6. Press the OPEN/CLOSE key on the front panel to check the Tray Lock setting.

NB: No indications on the screen when the Tray Lock is setting.

To unlock the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Set the DVD to the Stop Mode.
3. Set the VOLUME to minimum.
4. Press and hold the 'REC/OTR' button on the front panel.
5. Simultaneously press and hold the '4' key on the remote control unit.
6. Hold both keys for more than 2 second.
7. The On Screen Display message 'INITIALIZE5 COMPLETE' will appear.
8. The Tray Lock has now been cleared.

NB: The above procedure will reset ALL of the player's settings to the default factory state.

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GENERAL SPECIFICATIONS

G-1	**TV System**	CRT		CRT Size / Visual Size	20 inch / 508.0mmV
				CRT Type	Flat
				Deflection	90 degree
				Magnetic Field BV/BH	+ 0.45 G / 0.18 G
		Color System			NTSC
		Speaker			2 Speaker
				Position	Front
				Size	1.8 x 3.9 Inch
				Impedance	8 ohm
		Sound Output		MAX	1.5W + 1.5W
				10%(Typical)	1.5W + 1.5W
G-2	**VCR System**	System			VHS Player / Recorder
		Video System			NTSC
		Hi-Fi STEREO			Yes
		NTSC PB			-
		Deck		DECK	OVD-7
				Loading System	Front
				Motor	3
		Heads	Video Head		4 Heads
			FM Audio Head		2 Heads
			Audio /Control		Mono /Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	-
				NTSC	SP/SLP(EP)
			Play	PAL	-
				NTSC	SP/SLP(EP)
		Fast Forward / Rewind Time (Approx.) at 25oC			FF:1'48"/REW:1'48"
				with Cassette	T-120
		Forward/Reverse Picture Search		NTSC or PAL-M	SP/SLP(EP)=3x,5x / 9x,15x
		Frame Advance			Yes
		Slow Speed			1/10
G-3	**DVD System**	Color System			NTSC
		Disc			DVD, CD-DA, CD-R/RW, Video CD
		Disc Diameter			120 mm , 80 mm
		Deck		Disc Loading System	Front Loading
				Motor	2 Motors
		Pick up			1-Lens 2-Beams System
		Playback time(Max)		DVD 1-Layer	135min (4.7GB)
				DVD 2-Layer	245min (8.5GB)
				CD	74min
				Video CD	-
		Search speed		Fwd	2-15 times / 4 step (DVD,VIDEO CD)
					2-20 times / 4 step (CD)
				Actual	2-45 times (DVD,VIDEO CD)
					4-40 times (CD)
				Rew	2-15 times / 4 step (DVD,VIDEO CD)
					2-20 times / 4 step (CD)
				Actual	2-45 times (DVD,VIDEO CD)
					4-40 times (CD)
		Slow speed		Fwd	1/8-1/2 times(DVD,VIDEO CD)
				Actual	-
				Rew	-
				Actual	-
G-4	**Tuning System**	Broadcasting System			US System M
		Tuner and Receive CH		System	1 Tuner
				Destination	US(w/CATV)
				Tuning System	F-Synth
				Input Impedance	VHF/UHF 75 ohm
				CH Coverage	2~69, 4A,A-5~A-1, A~I, J~W,W+1~W+84
		Intermediate Frequency		Picture(FP)	45.75MHz
				Sound(FS)	41.25MHz
				FP-FS	4.5MHz
		Preset CH			No
		Stereo/Dual TV Sound			US-Stereo
		Tuner Sound Muting			Yes

GENERAL SPECIFICATIONS

G-5	**Signal**	Video Signal	Input Level	1 V p-p/75 ohm
			Output Level	1 V p-p/75 ohm
			S/N Ratio (Weighted) at DVD Mode	65dB
			S/N Ratio (Weighted) at VCR Mode	50dB
			Horizontal Resolution at DVD Mode	400 Lines
			Horizontal Resolution at VCR(SP)Mode	220 Lines
		RGB Signal	Output Level	-
		Audio Signal	Input Level	-8.0dBm/50k ohm
		VCR	Output Level(0dB=0.775Vrms)	-8.0dBm/1k ohm
		DVD	Output Level(-20dBFs 0dBFs=2.0Vrms)	-12.0dBm/1k ohm
			Digital Output Level	0.5 V p-p/75 ohm(DVD)
			S/N Ratio at DVD (Weighted)	90 dB
			S/N Ratio at VCR (SP)(CCIR Filter:ON)	38 dB
			Harmonic Distortion at DVD Mode	0.06% (1kHz)
			Harmonic Distortion at VCR(SP) Mode	1.5% (1kHz) Typical
			Frequency Response :	
			DVD Mode at DVD	4Hz - 22kHz
			at Video CD	4Hz - 20kHz
			at CD	4Hz - 20kHz
			VCR Mode at SP	100Hz - 10kHz
			at LP	-
			at SLP	100Hz - 4kHz
		Hi-Fi Audio Signal	Dynamic Range : More than	90 dB
			Frequency Response :	20Hz - 20kHz
			Wow And Flutter : Less than	0.01 %Wrms
			Channel Separation : More than	60 dB
			Harmonic Distortion : Less than	1.0 %
G-6	**Power**	Power Source	AC	120V,60Hz
			DC	-
		Power Consumption	at AC	110 W at 120 V 60 Hz
			at DC	-
			Stand by (at AC)	4 W at 120 V 60 Hz
			Per Year	-
		Protector	Power Fuse	Yes
			Dew Sensor	No
G-7	**Regulation**		Safety	UL
			Radiation	FCC
			X-Radiation	DHHS
			Laser	DHHS
G-8	**Temperature**		Operation	+5oC ~ +40oC
			Storage	-20oC ~ +60oC
G-9	**Operating Humidity**			Less than 80% RH

GENERAL SPECIFICATIONS

G-10	**On Screen Display (TV/VCR)**	Menu			Yes
		Menu	Type		Character
		Timer Rec Set			Yes
		Channel Setup			Yes
			TV/CATV		Yes
			Auto CH Memory		Yes
			Add/ Delete		Yes
			Guide CH Set		No
		TV Setup			Yes
			V-chip Set		Yes
			On/Off Timer Set		Yes
			Picture		Yes
			Audio		Yes
			Surround		Yes
			Stable Sound		Yes
			Sap On/Off		Yes
		Auto Repeat On/Off			Yes
		System Setup			Yes
			Clock Set		Yes (Calendar 12h)
			Language		Yes
			Auto Clock On/Off		Yes
			Standard Time		Yes
			Daylight Saving Time		Yes
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry			No
		TV/VCR			Yes
		DVD			Yes
		Clock / Date			Yes
		CH/AV(LINE)/DVD			Yes
		Tape Counter(Linear Counter)			Yes
		Tape Speed			Yes
		Sleep Time			Yes
		Stereo/Audio Output			Yes
			Bilingual		No
			SAP		Yes
		Control Level	Volume		Yes
			Brightness/Contrast/Sharpness/Color		Yes
			Tint		Yes
			Bass/Treble/Balance		Yes
			Manual Tracking		Yes
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)			Yes
		Auto Tracking/Manual Tracking			Yes
		Caption / Text			Yes
		Index			No
		Mute			Yes
		Hi-Fi			Yes
		Repeat			Yes
		Zero Return			Yes
		DEW			No

GENERAL SPECIFICATIONS

G-11	**On Screen Display (DVD)**	Menu		Yes	
			Menu Type	Character	
		Language		Yes	
			OSD Language	Yes	
			Menu	Yes	
			SubTitle	Yes	
			Audio	Yes	
		Picture		Yes	
			TV Screen Size	Yes	
			OSD Display On/Off	Yes	
		Sound		Yes	
			DRC (Dynamic Range Control)	Yes	
			dts Decode	No	
			Output(5.1ch/ 2ch)	No	
			Surround On/Off	No	
			Center On/Off	No	
			Sub Woofer On/Off	No	
		Parental		Yes	
			Password Lock/ Un Lock	Yes	
			Rating Level	Yes	
		Open		Yes	
		Close		Yes	
		No disc		Yes	
		Reading		Yes	
		Play		Yes	
		Still/Pause		Yes	
		Stop		Yes	
		Prohibit Mark		Yes	
		Step		Yes	
		Skip(>>|)		Yes	
		Skip(|<<)		Yes	
		Random		Yes (CD)	
		Repeat		Yes	
		Slow+ ##		Yes	
		Slow- ##		No	
		Search+ ##		Yes	
		Search- ##		Yes	
		Jump		Yes	
		Resume		Yes	
		Title No.		Yes	
		Chapter No.		Yes	
		Track No.		Yes	
		Time		Yes	
		Sub Title No.		Yes	
		Angle No.		Yes	
		Vocal On/Off		No	
		Audio No.		Yes	
		Audio Stereo L/R		Yes (Video CD)	
		Zoom		Yes	
		Marker No.		No	
		Program Play Back		Yes (CD)	
		Surround On/Off		No	
		Screen Saver		No	
		MP3	Folder Name	No	
			File Name	No	
			File No	No	
			Time	No	
			Track No	No	
G-12	**OSD Language**	TV/VCR		English French Spanish	
		DVD		English French Spanish	
G-13	**Clock,Timer and Timer Back-up**	Calendar		1990/1/1 ~ 2081/12/31	
		Timer Events		8 Program/ 1 Month	
		One Touch Recording Max Time		6 Hours	
		OTPB Valid Time		-	
		Sleep Timer	Max Time	120	Min
			Step	10	Min
		On/Off Timer	Program(On Timer / Off Timer)	1	Program
		Auto Shut Off	No Signal	15	Min
			No Operation	-	Min
		Timer Back-up (at Power Off Mode)		5	Sec

GENERAL SPECIFICATIONS

G-14	**Remote Control Unit**	Unit(for TOSHIBA)		RC-FG
		Glow in Dark Remocon		Yes
		Format		NEC
		Custom Code		40-BFh,44-BBh
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		48 Key
		Keys	TV/VCR	Yes
			DVD	Yes
			Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			Channel-	Yes
			Channel+	Yes
			Volume-	Yes
			Volume+	Yes
			Display	Yes
			Sleep	Yes
			Audio Select	Yes
			Mute	Yes
			Channel Return / Skip-	Yes
			Closed Caption / Skip+	Yes
			T-REC	Yes
			Rec(T-Rec/OTR)	Yes
			Rec/OTR	Yes
			Slow+	Yes
			Play	Yes
			Stop	Yes
			Rew	Yes
			F. Fwd	Yes
			Pause / Still	Yes
			CM Skip / Jump	Yes
			SP/SLP / Return	Yes
			Counter Reset / Angle	Yes
			Zero Return / Subtitle	Yes
			Input Select / Zoom	Yes
			Menu /Set Up	Yes
			Program / Repeat A-B	Yes
			D.Tracking / Top Menu	Yes
			Tracking+ / DVD Menu	Yes
			Tracking- / Play Mode	Yes
			Cancel/Clear	Yes
			3D Surround	No
			Cursor Up	Yes
			Cursor Down	Yes
			Cursor Left	Yes
			Cursor Right	Yes
			Enter	Yes
			VCR Plus+	No
			One More Search	No
			Remain/Counter	No
			Eject	No
			Index-	No
			Index+	No

GENERAL SPECIFICATIONS

G-15	**Features**	Auto Head Cleaning			Yes
		Auto Tracking			Yes
		HQ (VHS Standard High Quality)			Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject			Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)			No
		Auto Clock			Yes
		Forward / Reverse Picture Search			Yes
		Auto CH Memory			Yes
		Surround			Yes
		Stable Sound			Yes
		Closed Caption			Yes
		TV Auto Shut off Function			Yes
		End Call			No
		Index Search			No
		SQPB			No
		CATV			Yes
		CM Skip(30sec x 6 Times)			Yes
		Comb Filter (2Lines)			Yes
		VM Circuit			No
		TV Monitor			No
		Program Extend			No
		Choke Coil			No
		Energy Star			Yes
		Protect of FBT Leak Circuit			Yes
		Zero Return			Yes
		Power On Memory			No
		Dirty Head			No
		V-chip	USA V-chip		Yes
			CANADA V-chip		No
		Parental Lock	(DVD Only)		Yes
		Tray Lock			Yes
		Auto Stop	(Pause, and Resume Stop after 5min.)		Yes
		Video CD Playback			Yes
		MP3 Playback			No
		Digital Out	(Dolby Digital)		Yes
			(MPEG)		Yes
			(PCM)		Yes
			(DTS)		Yes
		Down Mix Out	(Dolby Digital)		Yes
			(DTS)		No
		TruSurround			No
		Screen Saver			No
		Audio DAC			192kHz / 24bit
G-16	**Accessories**	Owner's Manual	Language		English
			w/Guarantee Card		Yes
			Buyer Model No.		MW20FN1R
		Remote Control Unit			Yes
		Battery			Yes
			UM size x pcs		UM-4 x 2 pcs
			OEM Brand		No
		Rod Antenna			No
			Poles		-
			Terminal		-
		Loop Antenna			No
			Terminal		-
		U/V Mixer			No
		300 ohm to 75 ohm Antenna Adapter			Yes
		Antenna Change Plug			No
		DC Car Cord (Center+)			No
		AC Plug Adapter			No
		AC Cord			No
		AV Cord (2Pin-1Pin)			No
		Guarantee Card			No
		Registration Card			Yes
		ESP Card			No
		Warning Sheet			No
		Dew/AHC Caution Sheet			No
		Quick Set-up Sheet			No
		Circuit Diagram			No
		Service Facility List			No
		Important Safeguard			No
		Sheet Information (Return)			Yes[From '03 JUN O/R]

GENERAL SPECIFICATIONS

G-17	**Interface**	Switch	Front	Power (Tact)	Yes
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
				Play (VCR)	Yes
				Stop / Eject (VCR)	Yes
				F.FWD/Cue (VCR)	Yes
				Rew/Rev (VCR)	Yes
				REC/OTR (VCR)	Yes
				Play (DVD)	Yes
				Stop (DVD)	Yes
				Skip+ /Search+ (DVD)	Yes
				Skip- /Search- (DVD)	Yes
				Open/Close (DVD)	Yes
				Input Select	No
				Main Power SW	No
		Indicator		Power	Yes(Red)
				REC/OTR	Yes(Red)
				T-REC	Yes(Red)
				TV/VCR	No
				DVD	No
		Terminals	Front	Video Input	RCA x 1
				Audio Input	RCA x 2(Stereo)
				Other Terminal	HeadPhone (Stereo & Mono, 3.5mm)
			Rear	Video Input	RCA x 1
				Audio Input	RCA x 2(Stereo)
				Video Output	RCA x1
				Audio Output	RCA x 2(Stereo)
				Digital Audio Output	Coaxial (DVD Only)
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-18	**Set Size**			Approx. W x D x H (mm)	573 x 482 x 517
G-19	**Weight**			Net (Approx.)	27.0kg (59.5lbs)
				Gross (Approx.)	30.5kg (67.3lbs)
G-20	**Carton**		Master Carton		No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	Double/White
				Dimensions W x D x H(mm)	658 x 575 x 625
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	31
			Container Stuffing(40' container)		216 Sets
G-21	**Material**		Cabinet	Front	PS 94V0 DECABROM
				Rear	PS 94V0 DECABROM
				Jack Panel	-
			PCB	Non-Halogen Demand	No
				Eyelet Demand	Yes
G-22	**Environment**		Pb Free	Lead-free Solder	No
				Other	No
			Cd Free		No

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

1. Remove the 6 screws ①.
2. Remove the 2 screws ②.
3. Remove the Back Cabinet in the direction of arrow.

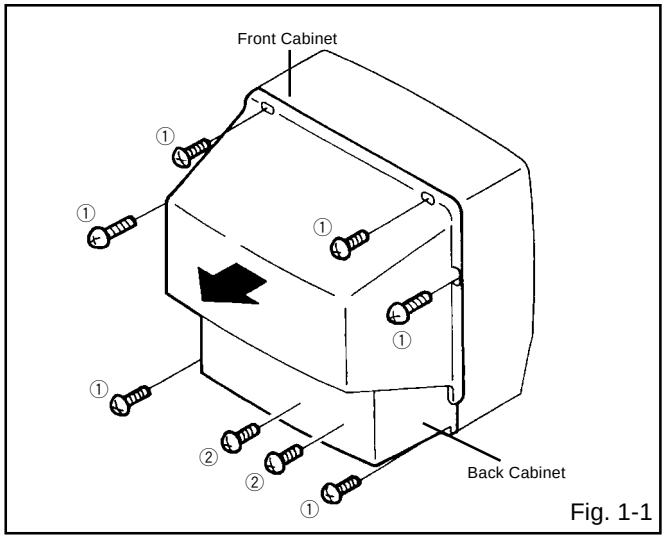


Fig. 1-1

1-2: CRT PCB (Refer to Fig. 1-2)

CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
   (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
   (CP603B, CP803 and CP805).
3. Remove the CRT PCB in the direction of arrow.

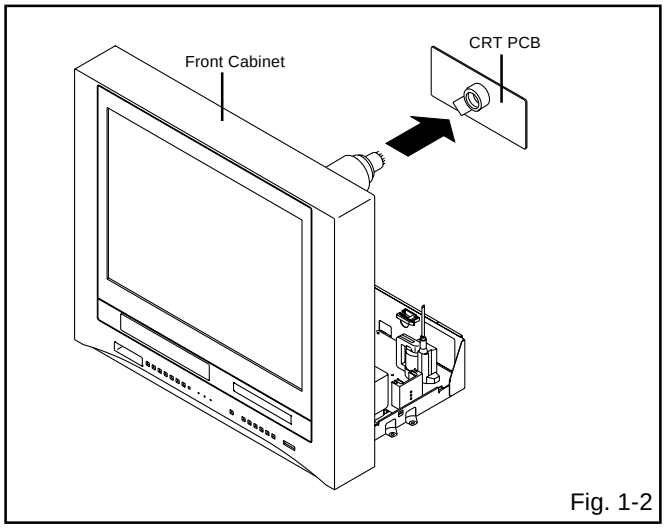


Fig. 1-2

1-3: TV/DVD/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
   (CP303, CP404 and CP1704).
3. Remove the TV/DVD/VCR Block in the direction of arrow.

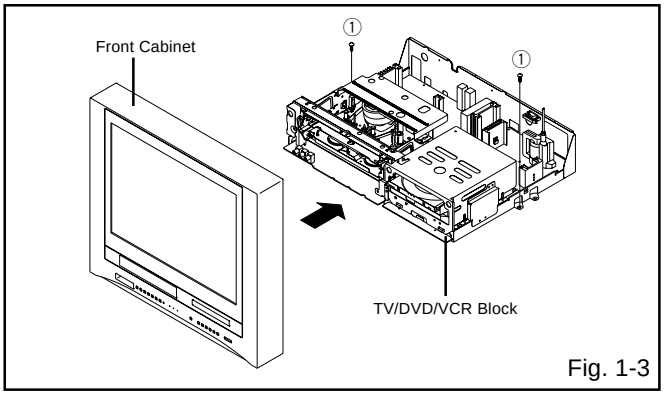


Fig. 1-3

1-4: VCR DECK (Refer to Fig. 1-4)

NOTE

Do not remove the cable at the FE Head section. The FE Head may be damaged if you remove the cable by force.

1. Remove the 2 screws ①.
2. Remove the VCR Top.
3. Remove the 2 screws ②.
4. Remove the VCR Holder.
5. Move the Cassette Holder Ass'y to the back side.
6. Remove the 3 screws ③.
7. Remove the 2 screws ④.
8. Remove the Deck Shield Cover.
9. Remove the screw ⑤.
10. Remove the FE Head.
11. Disconnect the following connectors:
    (CP101, CP4501 and CP4502).
12. Remove the VCR Deck in the direction of arrow.

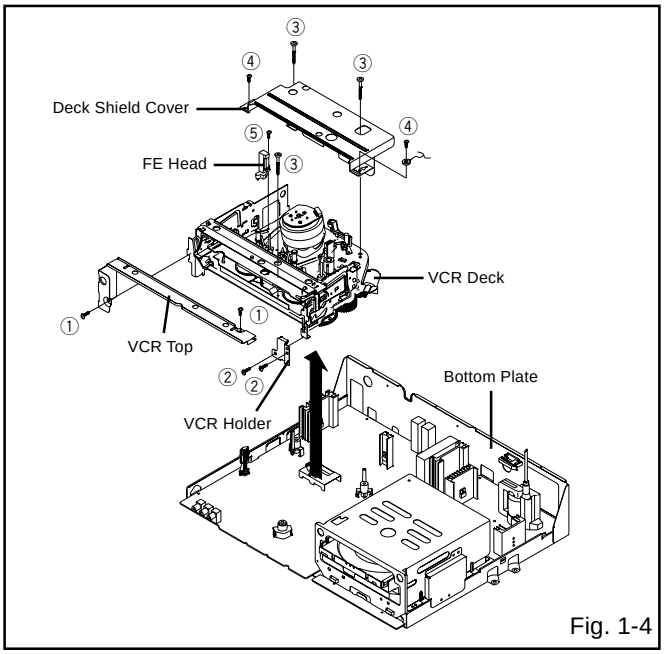


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

1-5: VCR PCB (Refer to Fig. 1-5)

1. Remove the 6 screws ①.
2. Remove the screw ②.
3. Remove the AV Jack Shield.
4. Disconnect the following connectors:
   (CP001, CP604, CP602B, CP2201, CP8001 and CP8002).
5. Remove the VCR PCB in the direction of arrow.

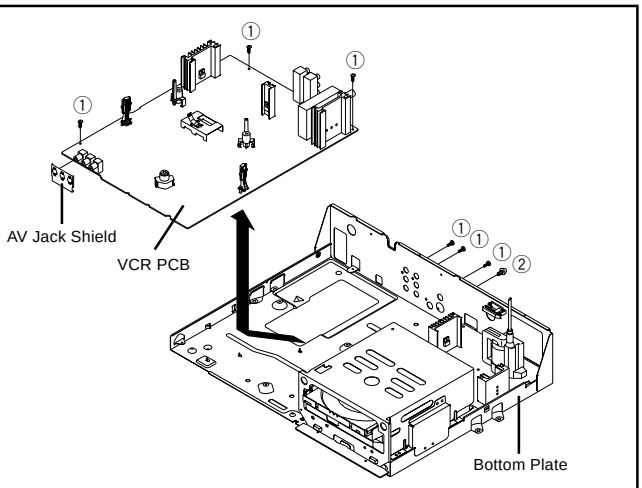


Fig. 1-5

1-6: VCR DECK (Refer to Fig. 1-6)

1. Remove the 2 screws ①.
2. Remove the DVD Shield.
3. Remove the 4 screws ②.
4. Remove the DVD Block in the direction of arrow (A).
5. Remove the 2 screws ③.
6. Remove the Operation PCB in the direction of arrow (B).

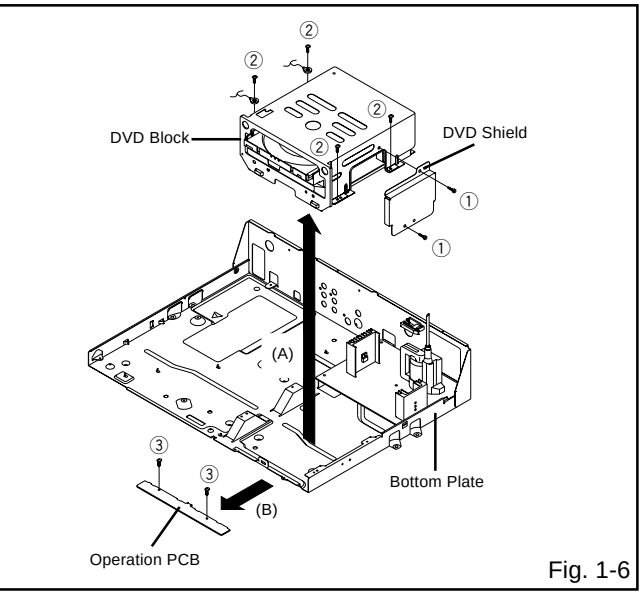


Fig. 1-6

1-7: DVD PCB/DVD DECK (Refer to Fig. 1-7)

1. Make the short circuit on the position as shown **Fig. 1-7** using a soldering. If you remove the DVD Deck with no soldering, the Laser may be damaged.
2. Remove the 3 screws ①.
3. Remove the DVD Top in the direction of arrow (A).
4. Disconnect the following connectors:
   (CP2001, CP2301 and CP2302).
5. Remove the 4 screws ②.
6. Remove the DVD Deck in the direction of arrow (B).
7. Remove the 4 screws ③.
8. Remove the DVD PCB in the direction of arrow (C).

NOTE

When the installation of the DVD Deck, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

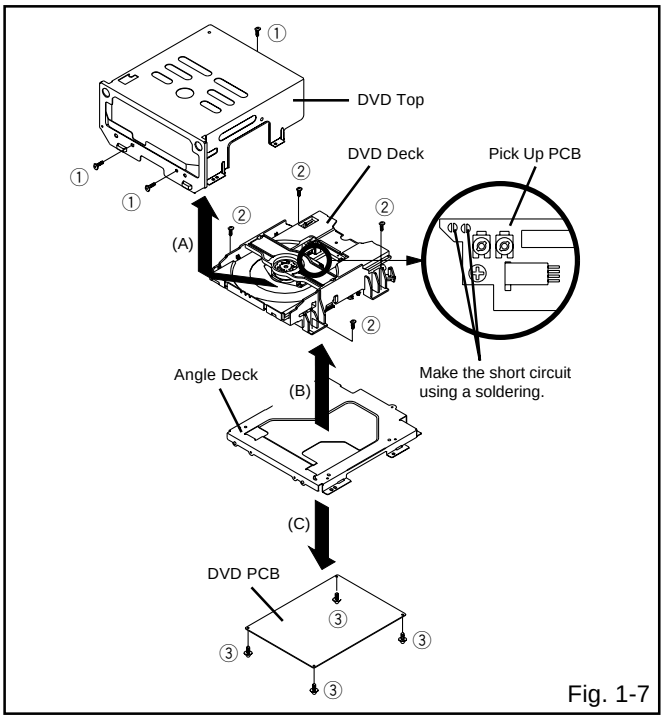


Fig. 1-7

1-8: DEFLECTION PCB (Refer to Fig. 1-8)

1. Remove the 2 screws ①.
2. Remove the 3 screws ②.
3. Remove the Deflection PCB in the direction of arrow.

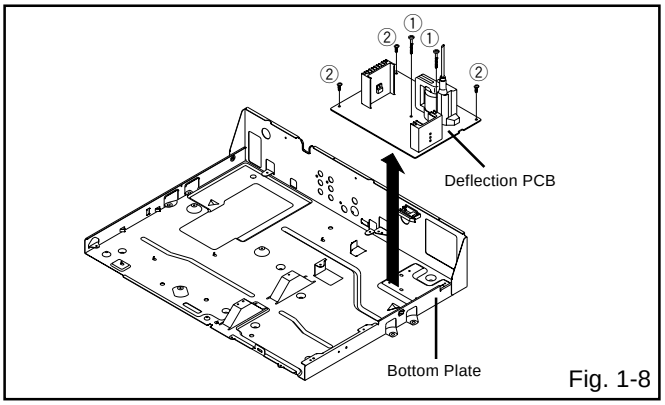


Fig. 1-8

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF VCR DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.

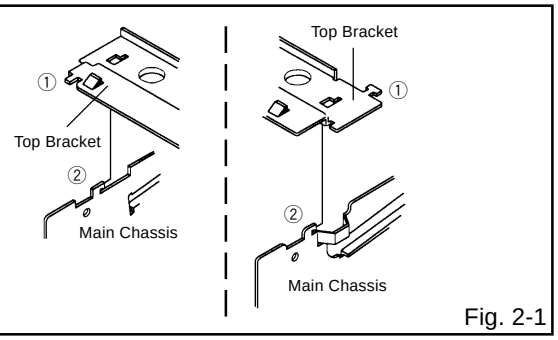


Fig. 2-1

2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

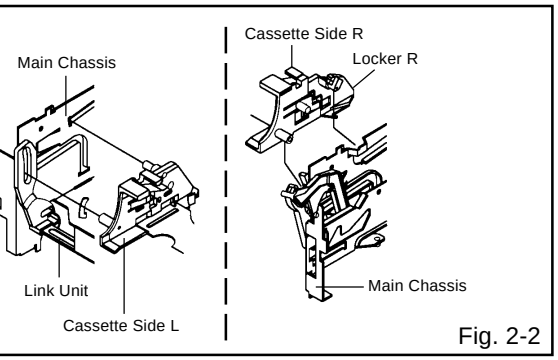


Fig. 2-2

2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.

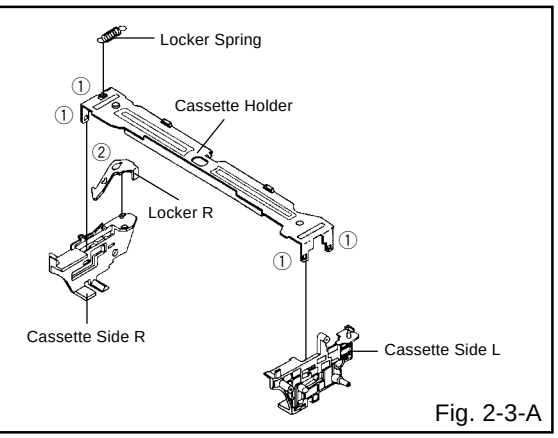


Fig. 2-3-A

NOTE

1. In case of the Locker R installation, check if the one position of Fig. 2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.

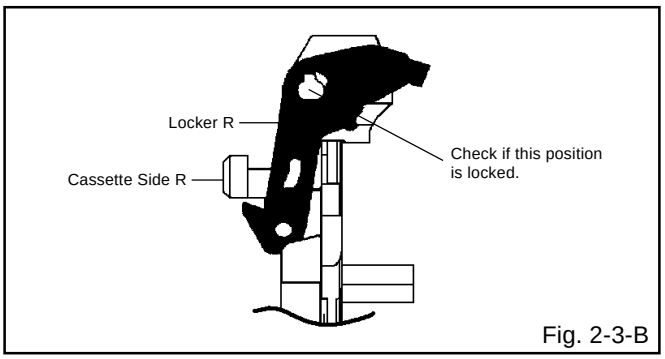


Fig. 2-3-B

2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.

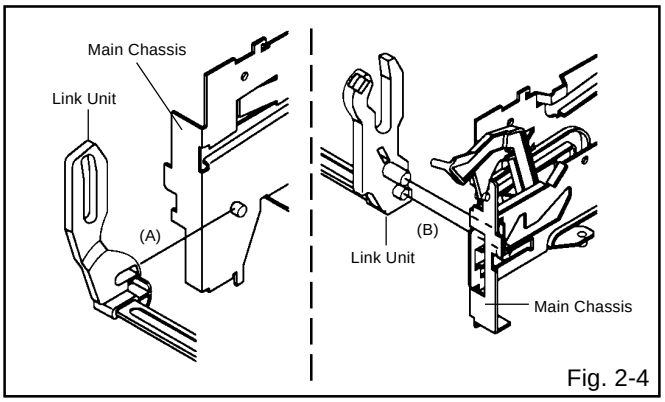


Fig. 2-4

2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.

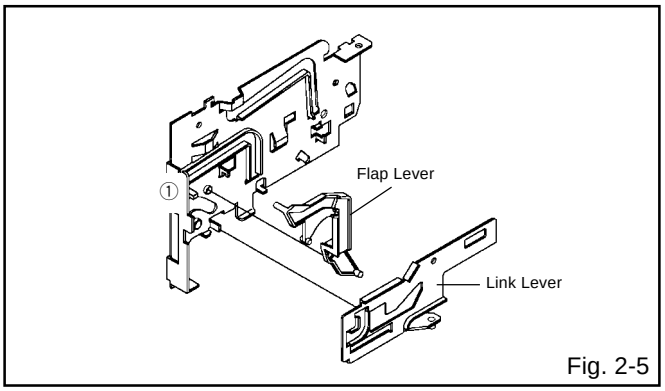


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.

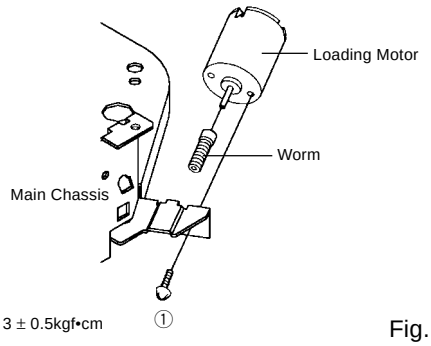


Fig. 2-6-A

NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, slacken the wire as shown Fig. 2-6-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-6-D.

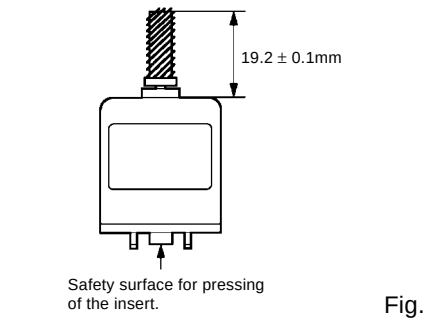


Fig. 2-6-B

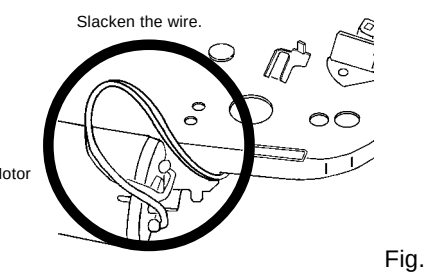


Fig. 2-6-C

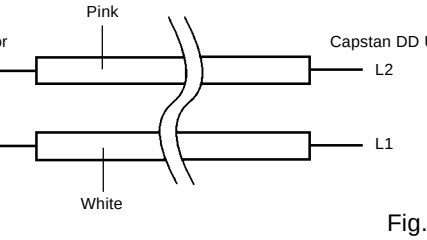


Fig. 2-6-D

2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

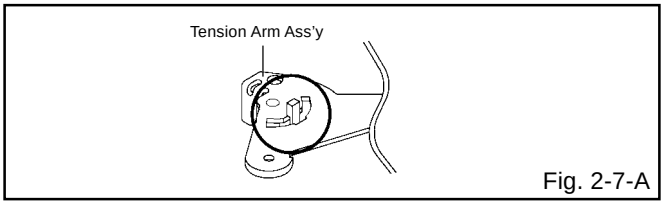


Fig. 2-7-A

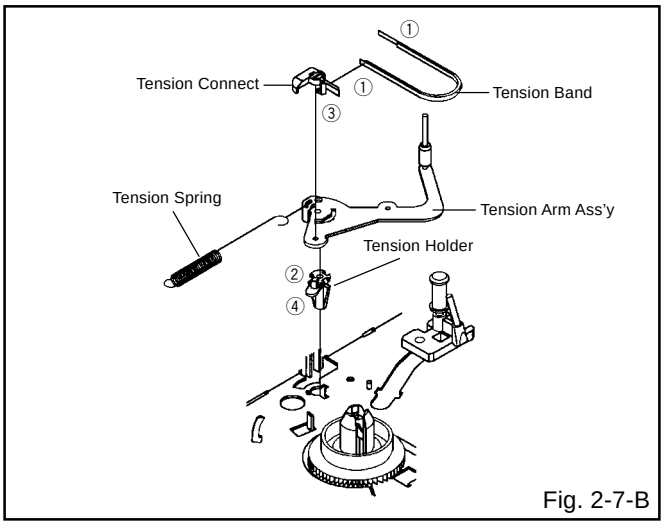


Fig. 2-7-B

NOTE

1. In case of the Tension Band installation, note the direction of the installation. **(Refer to Fig. 2-7-C)**
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.

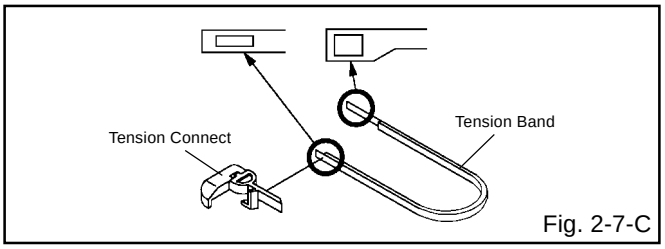


Fig. 2-7-C

DISASSEMBLY INSTRUCTIONS

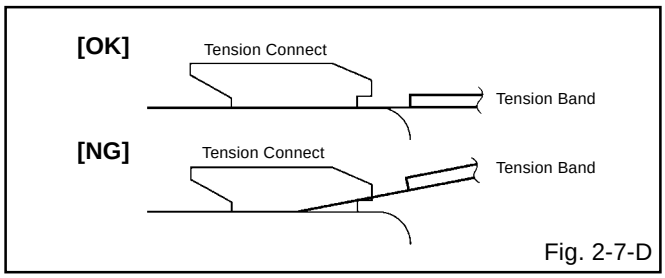


Fig. 2-7-D

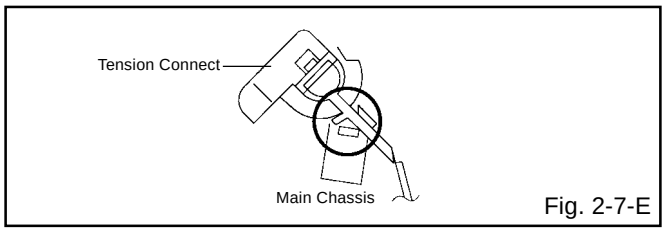


Fig. 2-7-E

2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.

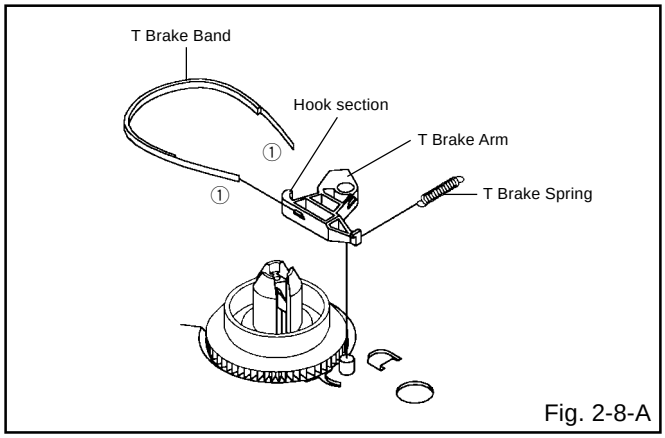


Fig. 2-8-A

NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

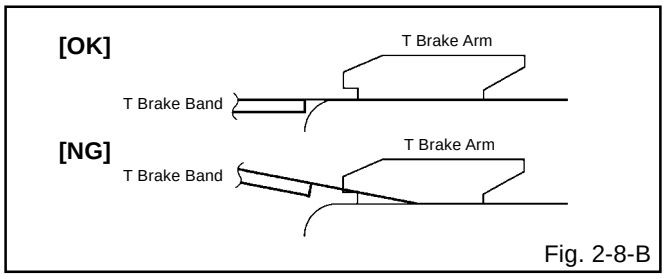


Fig. 2-8-B

2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-9-A)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

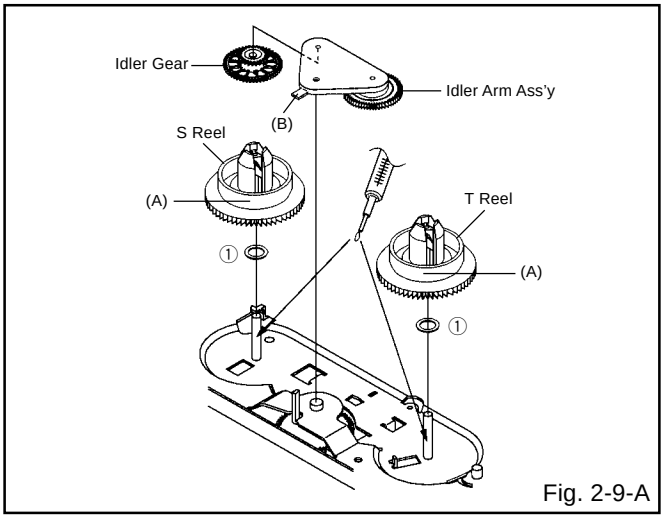


Fig. 2-9-A

NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. **(Refer to Fig. 2-9-B)**
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.

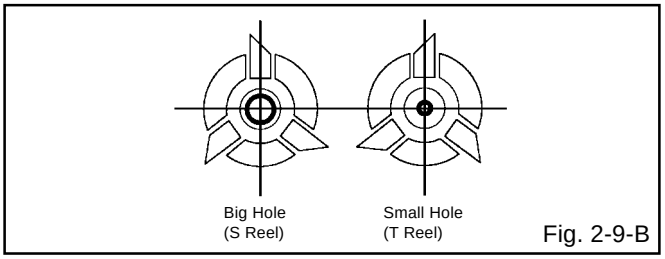


Fig. 2-9-B

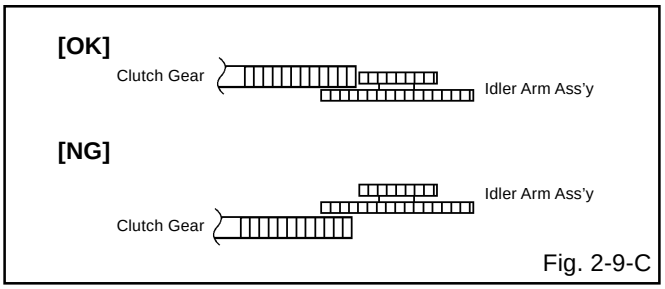


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.

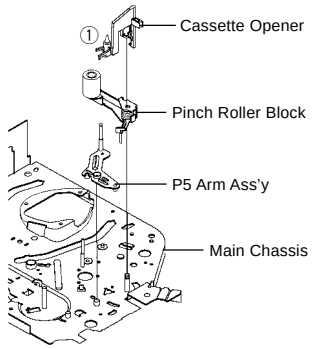


Fig. 2-10-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

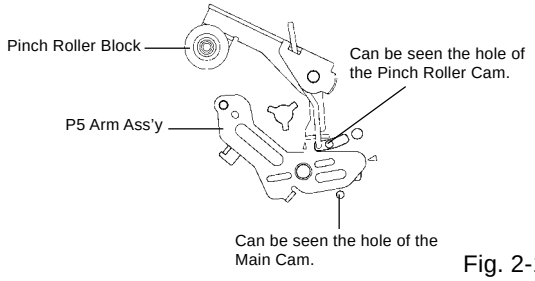


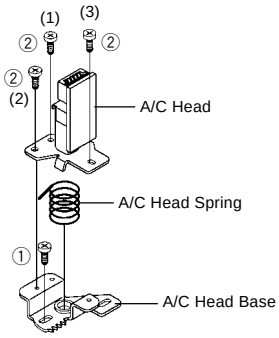
Fig. 2-10-B

2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: 5 ± 0.5kgf•cm (Screw ①)

Fig. 2-11-A

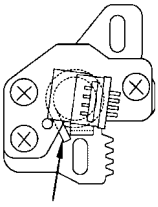
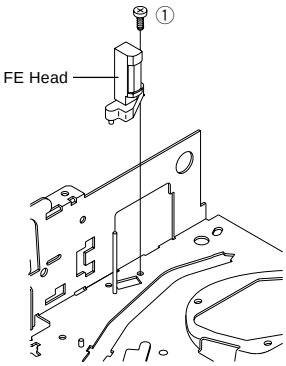


Fig. 2-11-B

2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.



• Screw Torque: 5 ± 0.5kgf•cm
• The FE Head is not installed on the Video Cassette Player.

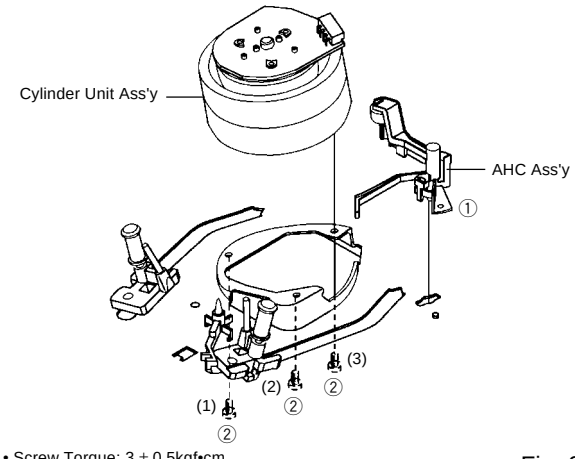
Fig. 2-12

2-13: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001)
3. Remove the 3 screws ②.
4. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



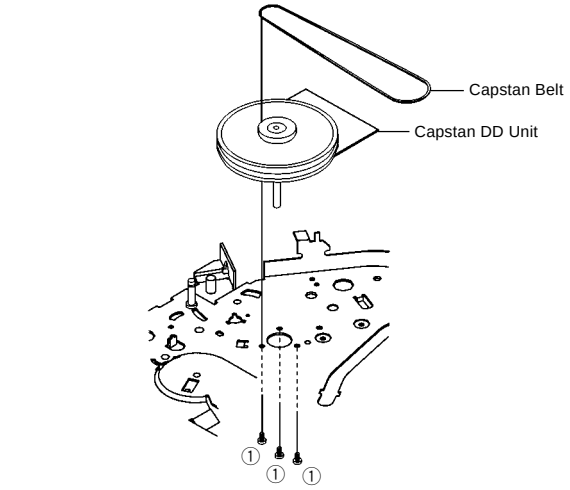
• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.



• Screw Torque: 4 ± 0.5kgf•cm

Fig. 2-14-A

NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.) **(Refer to Fig. 2-14-B, C)**

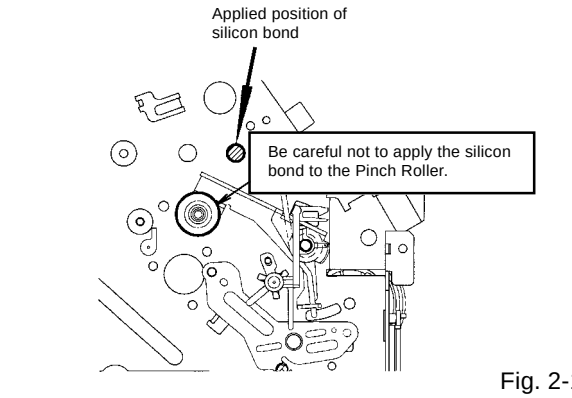


Fig. 2-14-B

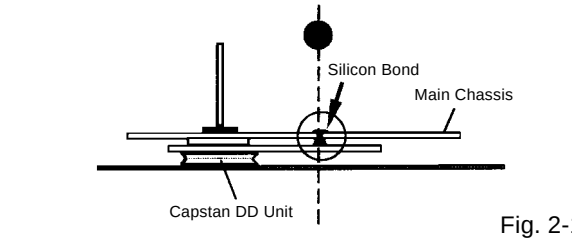


Fig. 2-14-C

2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

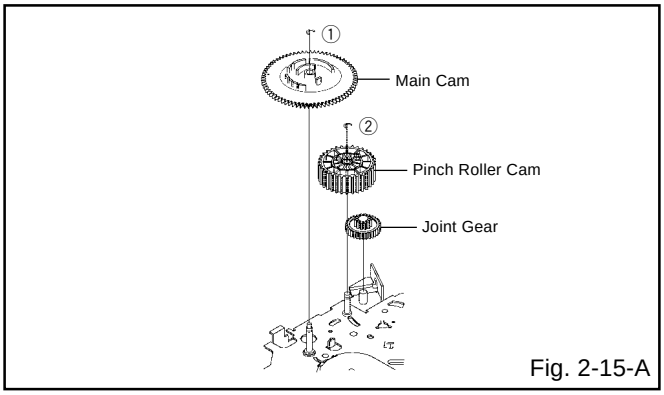


Fig. 2-15-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. **(Refer to Fig. 2-15-B)** And also can be seen the Main Chassis hole through the Main Cam maker hole.

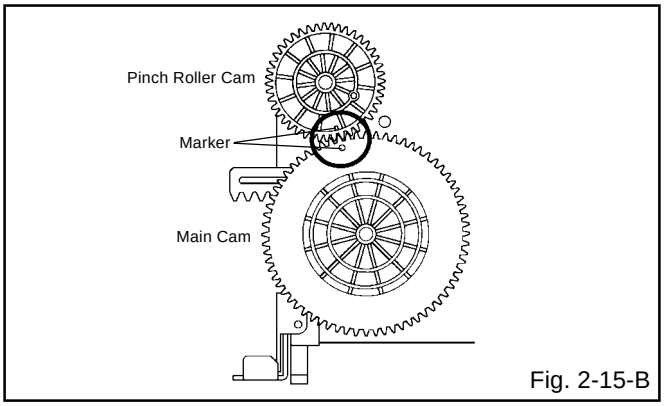


Fig. 2-15-B

2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

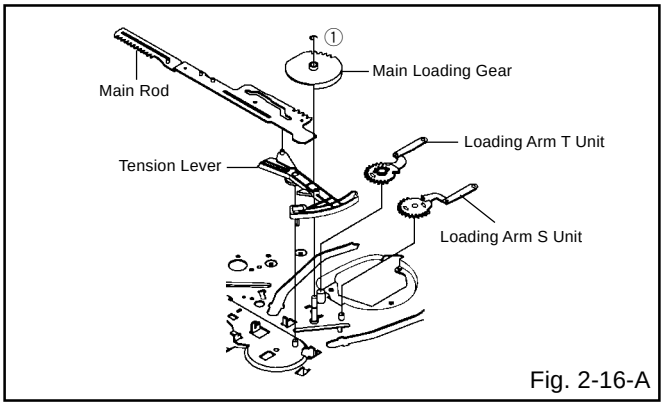


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. **(Refer to Fig. 2-16-B)**

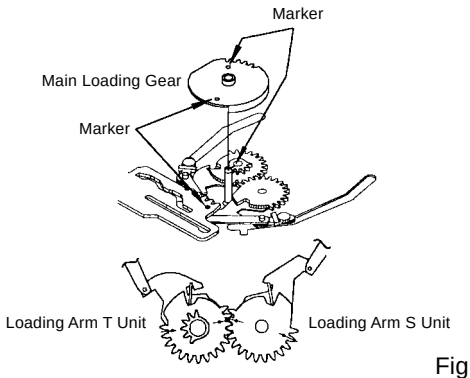


Fig. 2-16-B

2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.

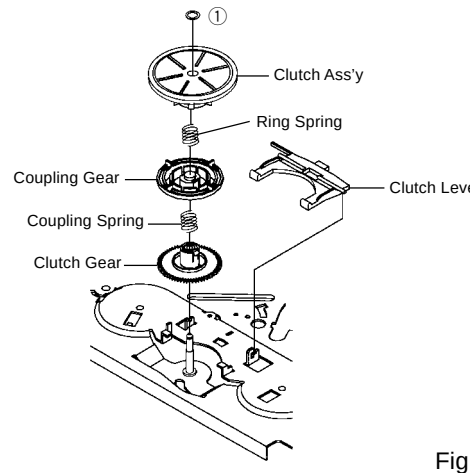


Fig. 2-17-A

NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. **(Refer to Fig. 2-17-B)**

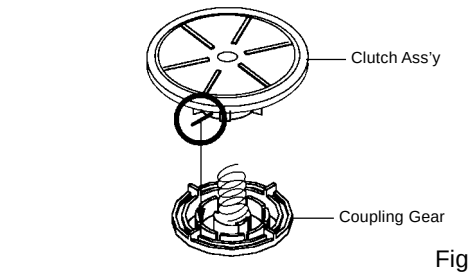


Fig. 2-17-B

2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw ②.
5. Remove the LED Reflector.

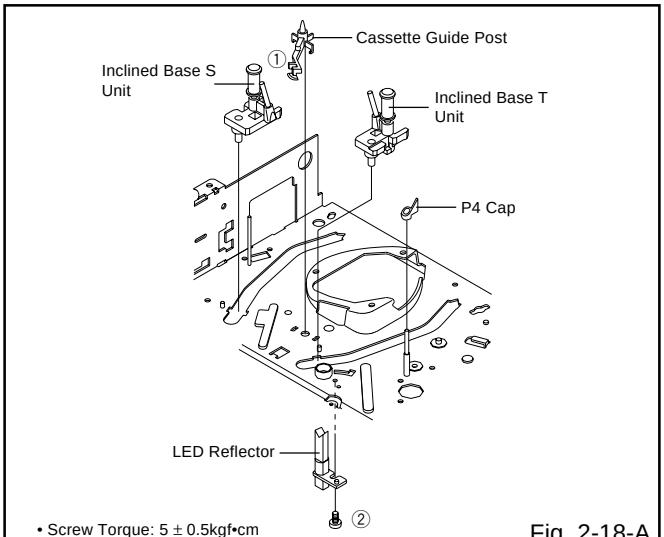


Fig. 2-18-A

NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.

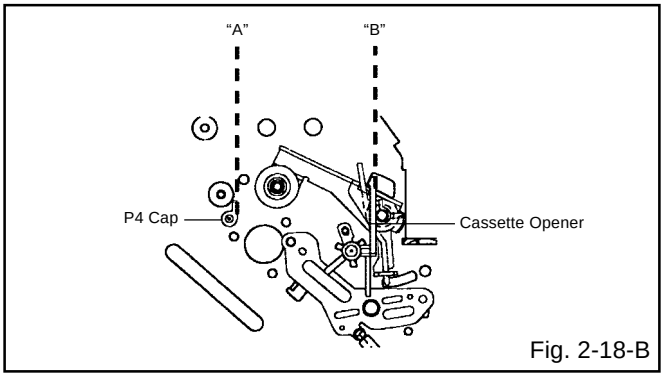


Fig. 2-18-B

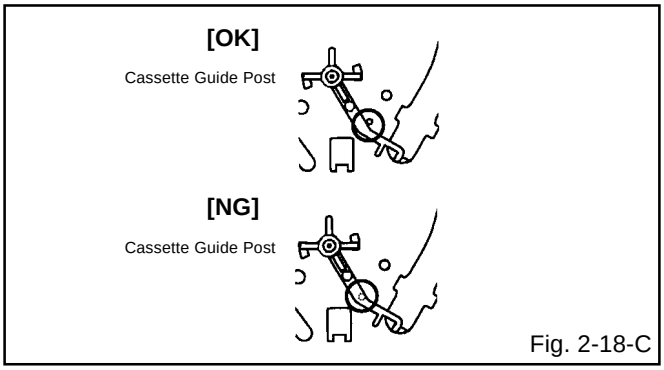


Fig. 2-18-C

DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF DVD DECK PARTS

NOTE

1. Do not disassemble the DVD DECK PARTS except listed parts here. Minute adjustments are needed if the disassemble is done. If the repair is needed except listed parts, replace the DVD MECHA ASS'Y.

3-1: TRAY (Refer to Fig. 3-1-A)

1. Set the Tray opened. **(Refer to the DISC REMOVAL METHOD AT NO POWER SUPPLY)**
2. Unlock the support ① and remove the Tray.

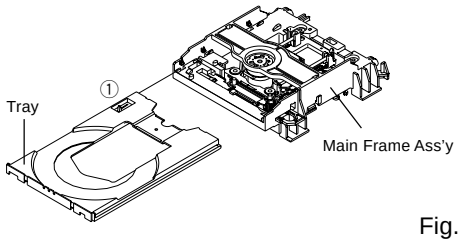


Fig. 3-1-A

NOTE

1. In case of the Tray installation, install them as the circled section of Fig. 3-1-B so that the each markers are met.

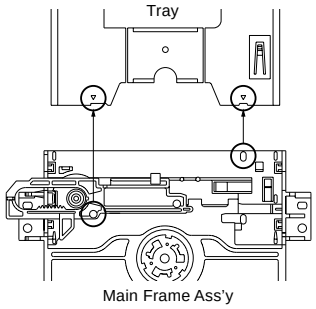


Fig. 3-1-B

3-2: MAIN CHASSIS ASS'Y (Refer to Fig. 3-2-A)

1. Remove the Main Chassis Ass'y from the Insulator (R).
2. Unlock the support ①.
3. Remove the Main Chassis Ass'y.

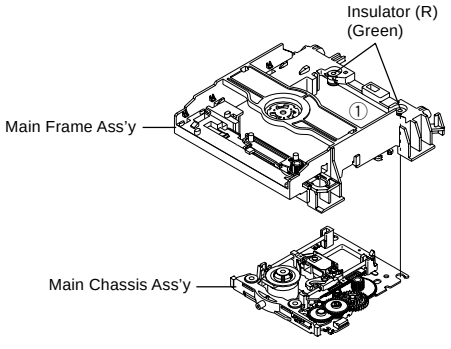


Fig. 3-2-A

NOTE

1. In case of the Main Chassis Ass'y, install it from (1) to (6) in order. **(Refer to Fig. 3-2-B)**

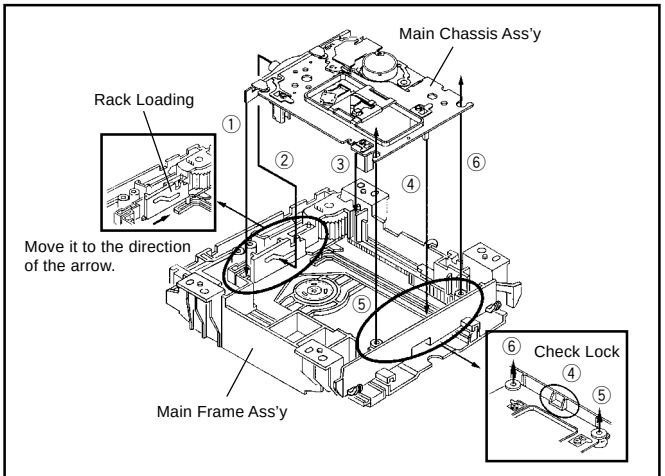


Fig. 3-2-B

3-3: RACK LOADING/MAIN GEAR/ RACK LOADING SPRING/ RACK L SPRING (Refer to Fig. 3-3)

1. Remove the Rack L Spring.
2. Press down the catcher ① and slide the Rack Loading.
3. Remove the Rack Loading, Rack Loading Spring and Main Gear.

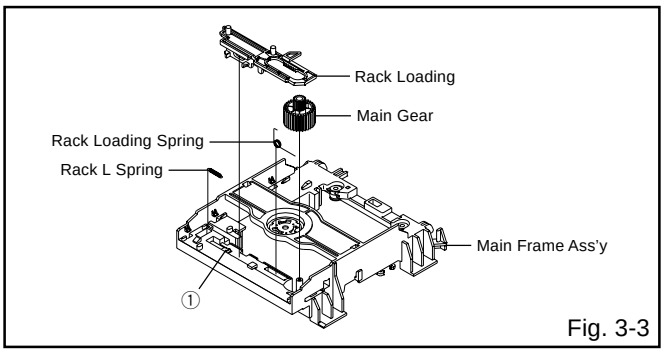


Fig. 3-3

3-4: CLAMPER ASS'Y/INSULATOR(R)/LEVER SWITCH (Refer to Fig. 3-4-A)

1. Remove the screw ①.
2. Remove the Lever Switch.
3. Remove the 2 Insulator (R).
4. Press the Clamper and rotate the Clamper Plate clockwise, then unlock the 3 supports ②.
5. Remove the Clamper Plate, Clamper Magnet and Clamper.

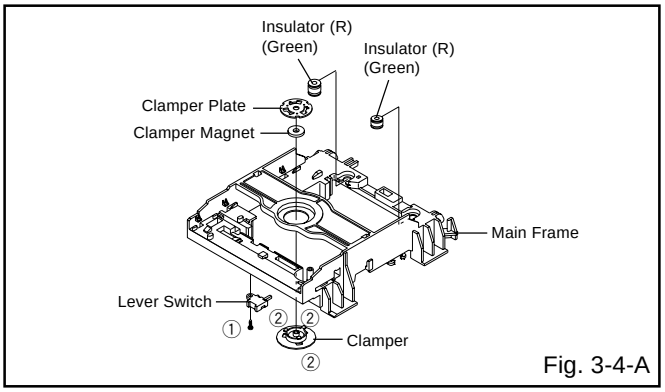


Fig. 3-4-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. When installing the Clamper Magnet, install it with the green face up.
2. When installing the wire of the Lever Switch, install it correctly as Fig. 3-4-B.
3. When installing the Lever Switch, install it correctly as Fig. 3-4-C.
4. In case of the Lever Switch installation, hook the wire on the Main Frame as shown Fig. 3-4-D.

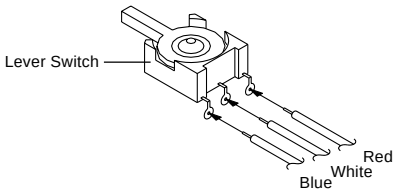


Fig. 3-4-B

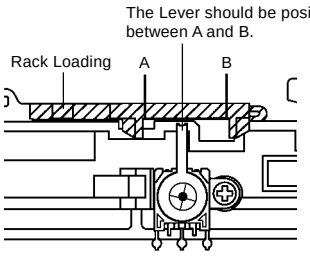


Fig. 3-4-C

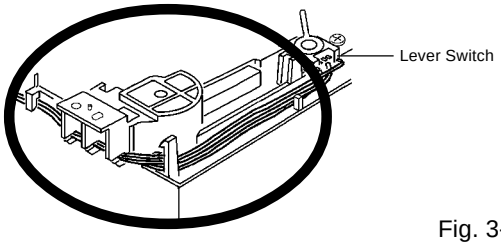


Fig. 3-4-D

3-5: TRAVERSE HOLDER/INSULATOR (F) (Refer to Fig. 3-5-A)

1. Remove the Traverse Holder.
2. Remove the 2 Insulator (F).

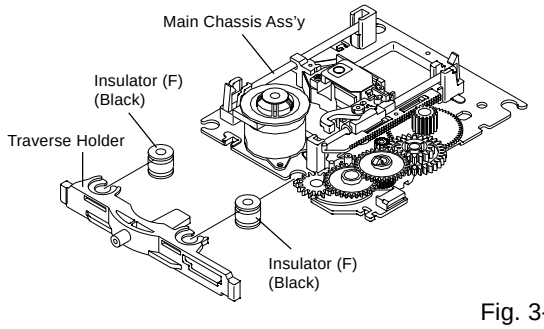


Fig. 3-5-A

NOTE

1. After the installing of the Traverse Holder, check if the wire is like Fig. 3-5-B.

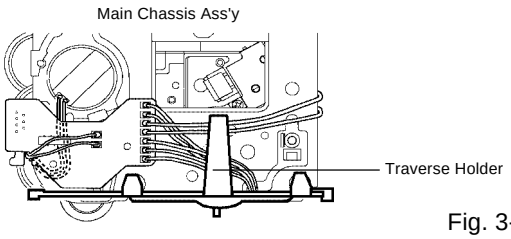


Fig. 3-5-B

3-6: SWITCH PCB ASS'Y (Refer to Fig. 3-6-A)

1. Remove the screw ①.
2. Remove the Switch PCB Ass'y.

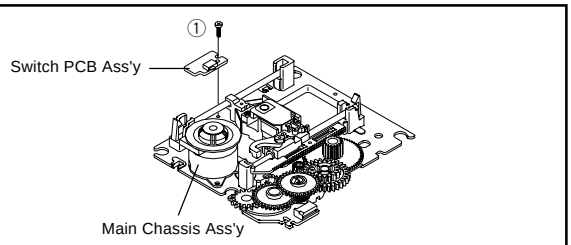


Fig. 3-6-A

NOTE

1. When installing the wire of the Switch PCB, install it correctly as Fig. 3-6-B.
2. When installing the wire of the Switch PCB, while pressing it in the direction of the arrow as shown Fig. 3-6-B, then instal it.

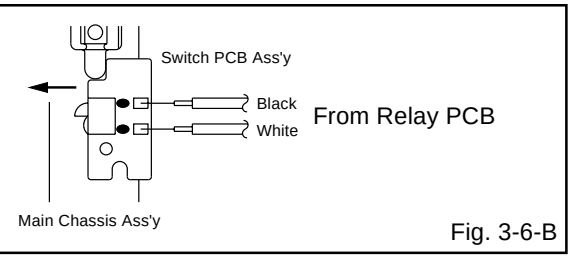


Fig. 3-6-B

3-7: RACK FEED ASS'Y (Refer to Fig. 3-7-A)

1. Remove the screw ①.
2. Remove the Rack Feed 1/2 Spring, Rack Feed 1/2 and Rack Feed Lever.

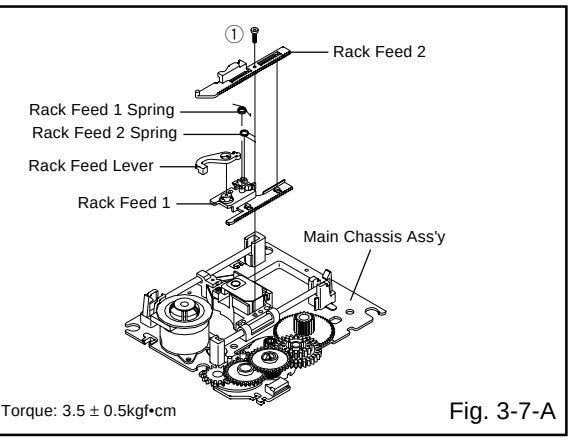


Fig. 3-7-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. After the assembly of the Rack Feed, check if the Rack Feed 1/2 is moving smoothly. **(Refer to Fig. 3-7-B)**
2. In case of the Rack Feed Ass'y installation, install correctly as Fig. 3-7-C.

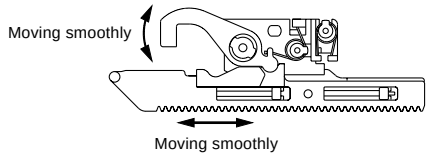


Fig. 3-7-B

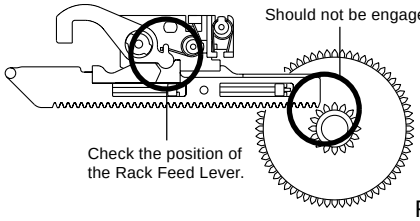


Fig. 3-7-C

3-8: RELAY PCB ASS'Y (Refer to Fig. 3-8-A)

1. Remove the screw ①.
2. Remove the Relay PCB Ass'y.

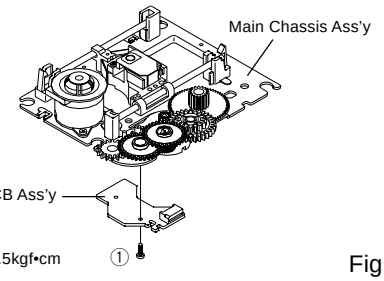


Fig. 3-8-A

NOTE

1. When installing the wire of the Relay PCB, install it correctly as Fig. 3-8-B.

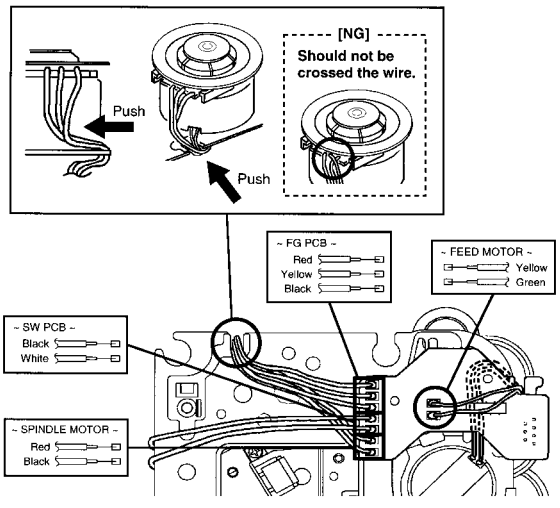


Fig. 3-8-B

3-9: GEAR (Refer to Fig. 3-9-A)

1. Unlock the support ①.
2. Remove the Middle Gear 1/2/3, Idler Gear and Feed Gear.

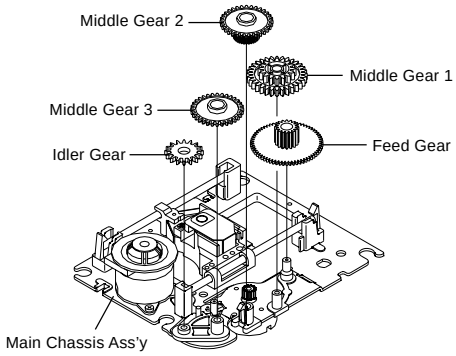


Fig. 3-9-A

NOTE

1. In case of the Idler Gear installation, install correctly as Fig. 3-9-B.
2. When installing the Middle Gear 2, check if the Middle Gear 2 is locked correctly as Fig. 3-9-C.

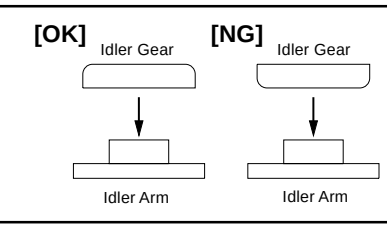


Fig. 3-9-B

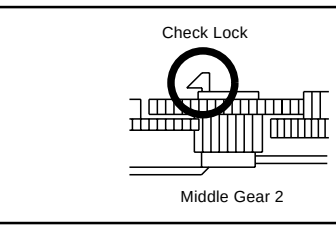


Fig. 3-9-C

3-10: IDLER ARM (Refer to Fig. 3-10-A)

1. Remove the Idler Arm Spring.
2. Remove the Chassis Spring.
3. Remove the Idler Arm.

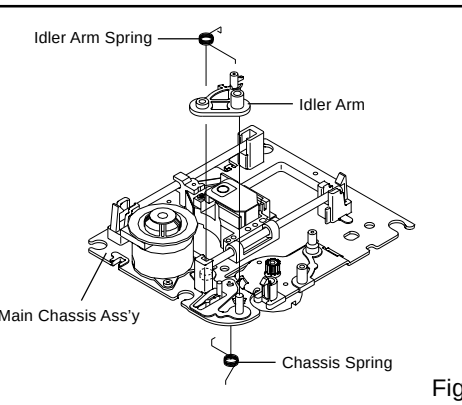


Fig. 3-10-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. In case of the Idler Arm installation, install as the circled section of Fig. 3-10-B.
2. In case of the Idler Arm Spring installation, install as the circled section of Fig. 3-10-C.
3. In case of the Chassis Spring installation, install as the circled section of Fig. 3-10-D.

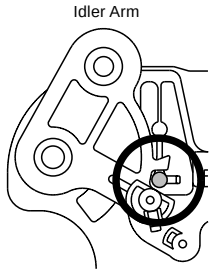


Fig. 3-10-B

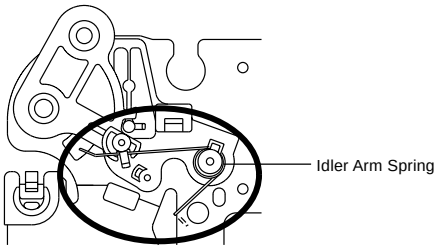


Fig. 3-10-C

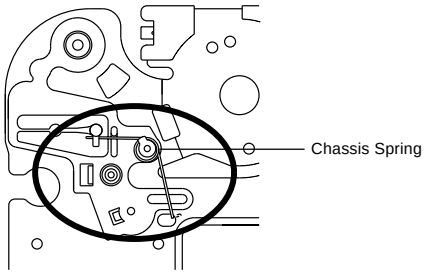
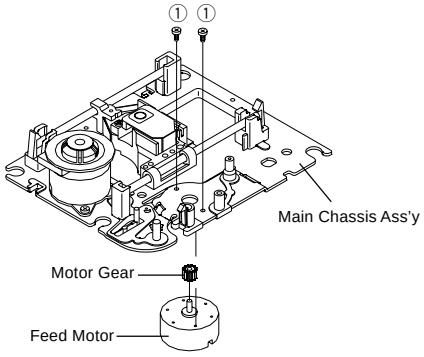


Fig. 3-10-D

3-11: FEED MOTOR (Refer to Fig. 3-11-A)

1. Remove the 2 screws ①.
2. Remove the Feed Motor.
3. Remove the Motor Gear.



• Screw Torque: 1 ± 0.5kgf•cm

Fig. 3-11-A

NOTE

1. In case of the Motor Gear installation, check if the value of the Fig. 3-11-B is correct.
2. When installing the Feed Motor, check if the cable is positioned as Fig. 3-11-C.

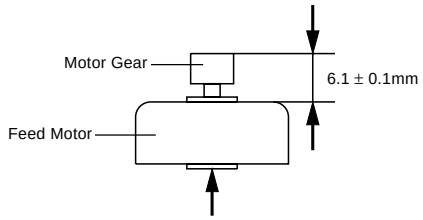


Fig. 3-11-B

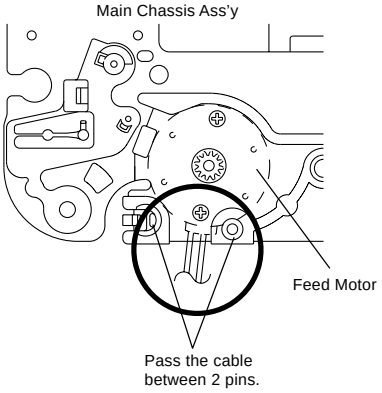


Fig. 3-11-C

DISASSEMBLY INSTRUCTIONS

4. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 4-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

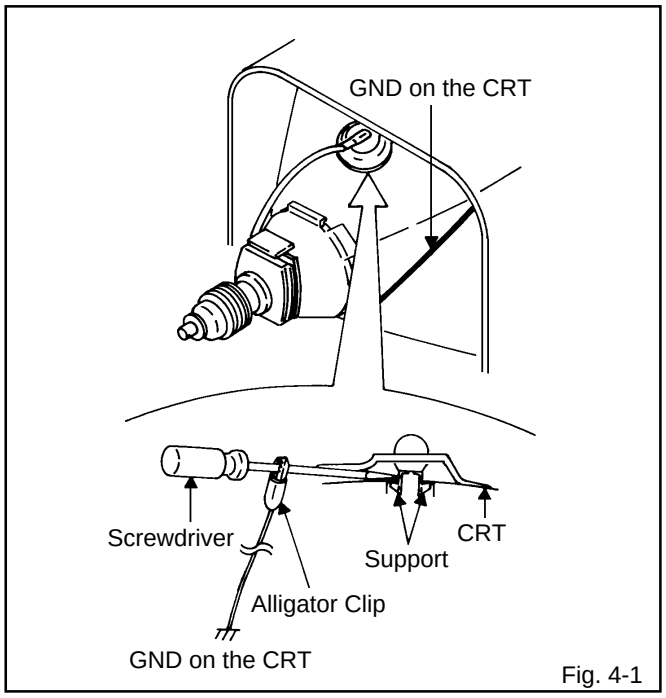


Fig. 4-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 4-2.)**

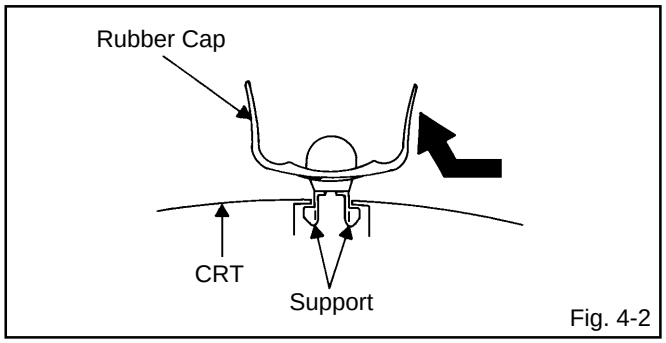


Fig. 4-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 4-3.)**

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

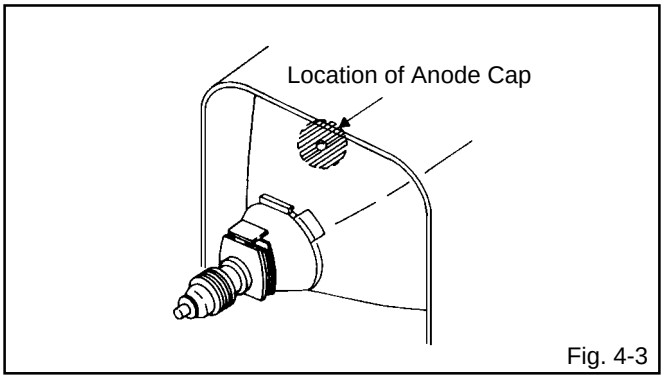


Fig. 4-3

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 4-4.)**

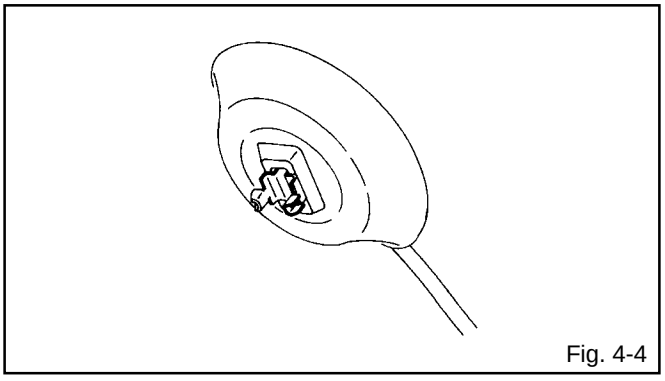


Fig. 4-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 4-5**.

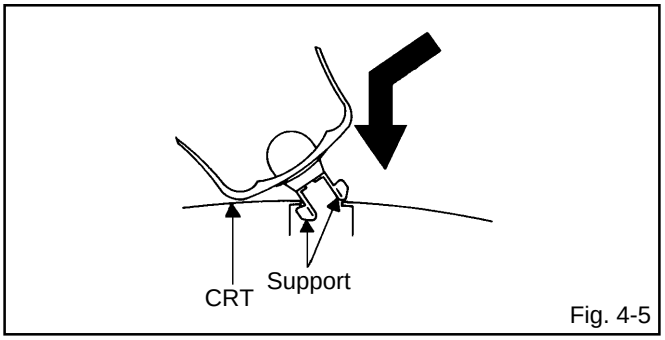


Fig. 4-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

5. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 5-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

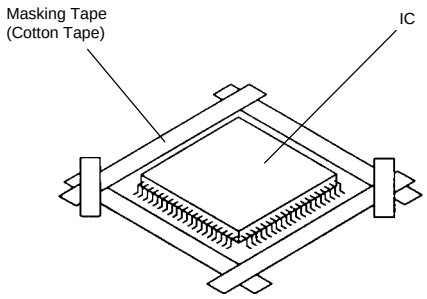


Fig. 5-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 5-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

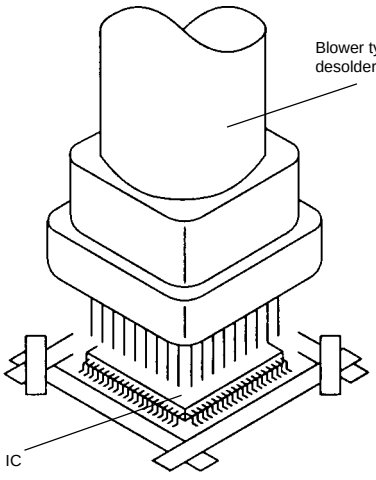


Fig. 5-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 5-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

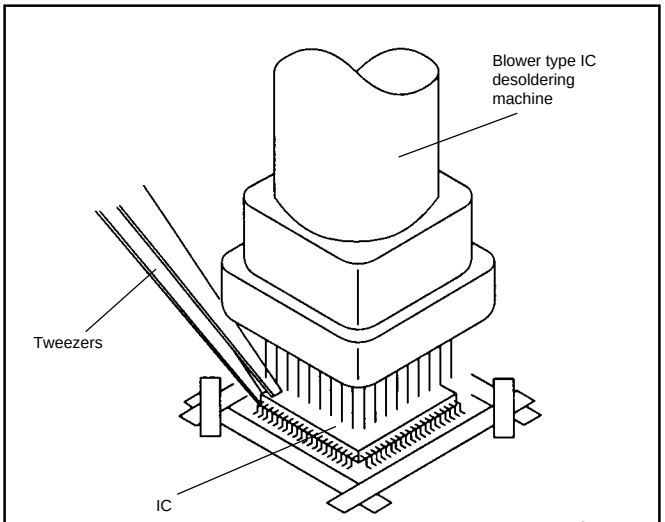


Fig. 5-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 5-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

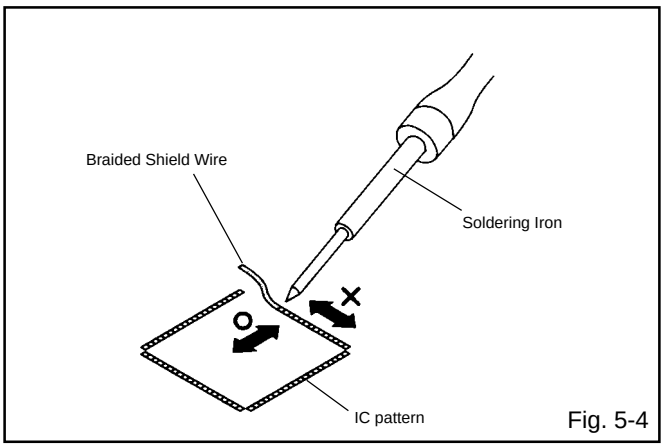


Fig. 5-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 5-5.)**

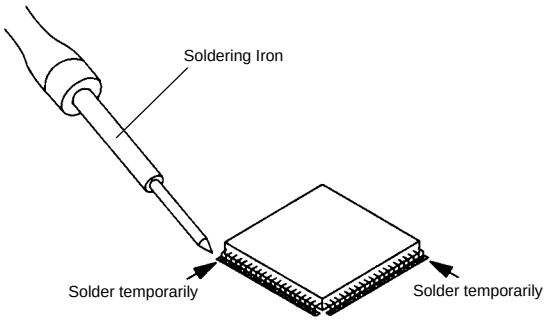


Fig. 5-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 5-6.)**

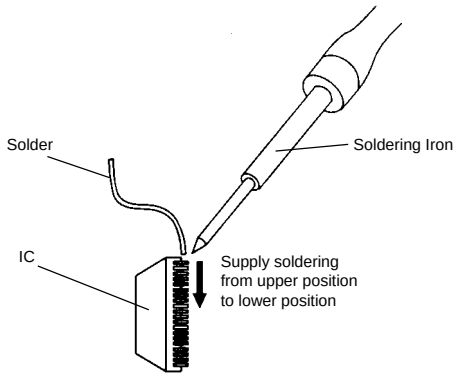


Fig. 5-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 5-7.)**

   NOTE

   Do not absorb the solder to excess.

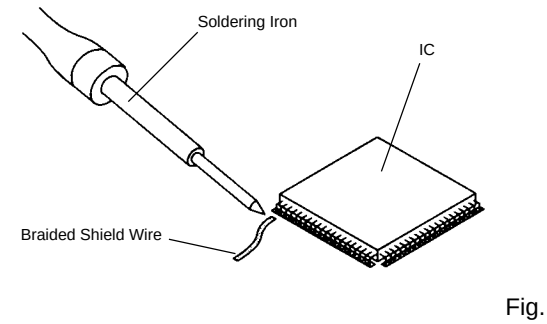


Fig. 5-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 5-8.)**

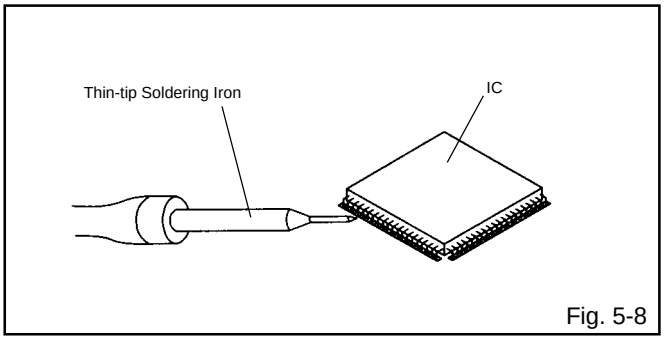


Fig. 5-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   NOTE

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	**A/C**	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	**BGP**	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	**C**	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	**DATA (SY-CE)**	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	**E**	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	**F**	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flip-flop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	**GEN**	:	Generator
	GND	:	Ground
H	**H.P.F**	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	**IC**	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	**KIL**	:	Killer
L	**L**	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	**M**	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	**NC**	:	Non Connection
	NR	:	Noise Reduction
O	**OSC**	:	Oscillator
	OPE	:	Operation
P	**PB**	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	**R**	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	**S. CLK**	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play

KEY TO ABBREVIATIONS

S	**STB**	:	Serial Strobe
	SW	:	Switch
	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
To enter SERVICE MODE, unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.
The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Standard Time (seconds)	Operations
VOL. (-) MIN	0	2	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	2	Initialization of the factory. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
VOL. (-) MIN	2	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	2	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	2	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	2	Adjusting of the Tracking to the center position.
VOL. (-) MIN	6	2	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	2	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).
REC/OTR	4	2	Initialization of the factory on DVD. NOTE: Do not use this for the normal servicing. The function will only work without the setting of DVD disc at DVD mode. While pressing the Remocon Key for more than the Standard Time, press the Set Key simultaneously.
STOP (DVD)	7	3	Releasing of PARENTAL LOCK. Refer to the “PARENTAL CONTROL - RATING LEVEL”. NOTE: The function will only work without the setting of DVD disc at DVD mode.
STOP (DVD)	9	3	Tray cannot be opened. Refer to the “TRAY LOCK”. NOTE: No indications on the screen when the Tray Lock is setting.

Set Key	Set Key	Standard Time (seconds)	Operations
VOL. (-) MIN	FF	2	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

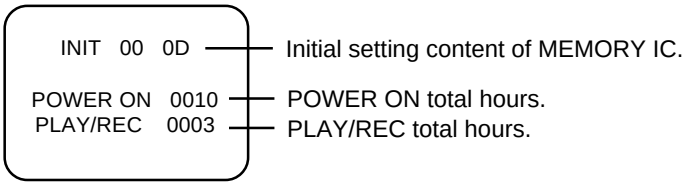
■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

POWER ON total hours and PLAY/REC total hours can be checked on the screen.
Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".
The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

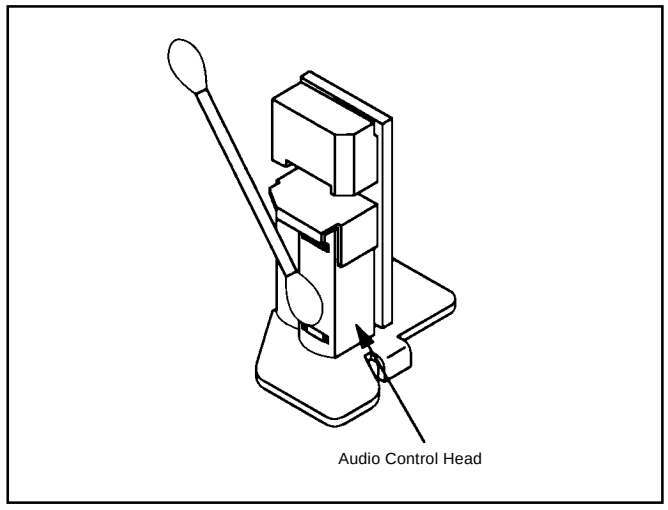
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

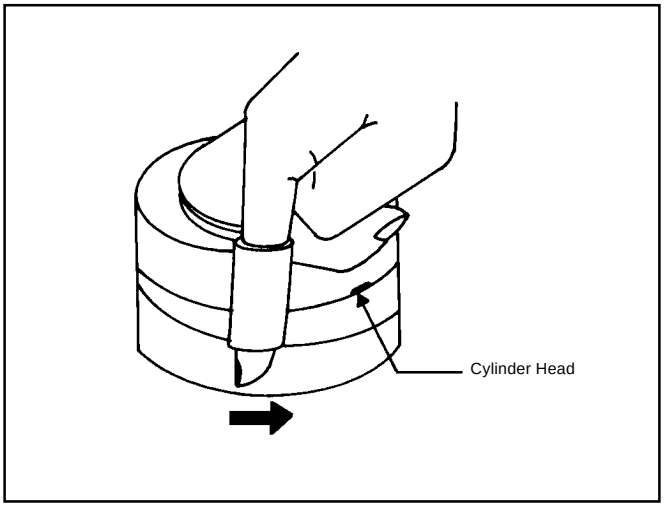
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.
No need setting for the position of the mark @ due to the adjustment value.
No need setting for after INI 3F due to the adjustment value..

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	0D	40	34	02	C3	DD	47	22	86	44	D0	08	A6	A0	86	35
10	40	0F	E3	52	03	87	00	48	00	FF	15	4B	1C	54	83	B2
20	9A	97	8C	A5	B7	A1	91	B6	1A	0B	3D	00	36	16	25	30
30	01	31	19	40	00	@	@	00	00	23	FF	FF	FF	FF	FF	FF

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

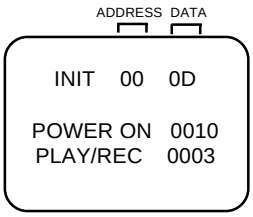


Fig. 1

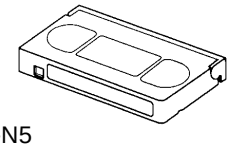
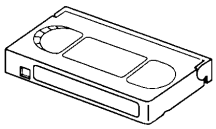
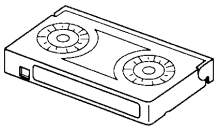
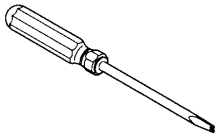
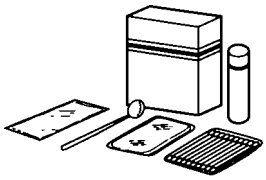
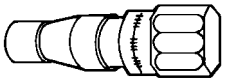
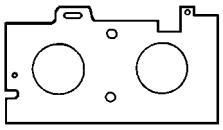
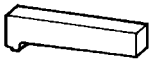
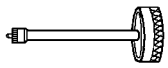
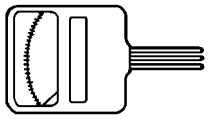
3. ADDRESS is now selected and should "blink". Using the UP or DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using UP or DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

After the data input, set to the initializing of shipping.

9. Turn POWER on.
10. Press both VOL. DOWN button on the set and the Channel button **(1)** on the remote control for more than 2 seconds.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	Tentelometer 

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment

PREPARATION FOR SERVICING

NOTE: The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the FF button on the set for more than 2 seconds.
   (The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
   Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

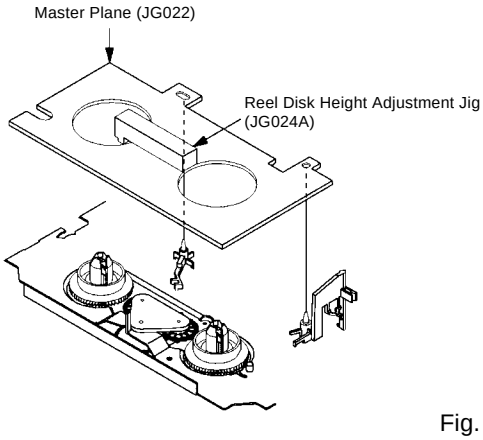


Fig. 1-1-A

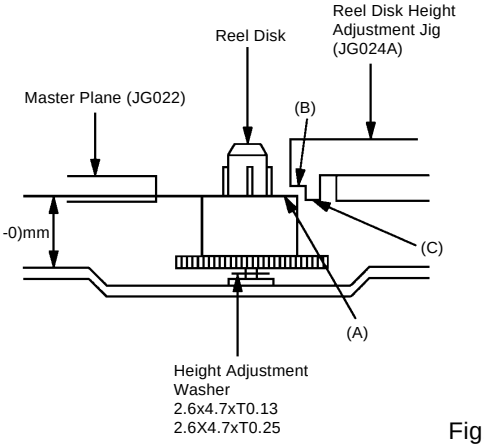


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

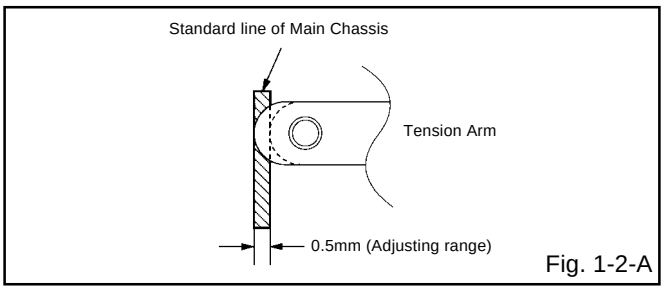


Fig. 1-2-A

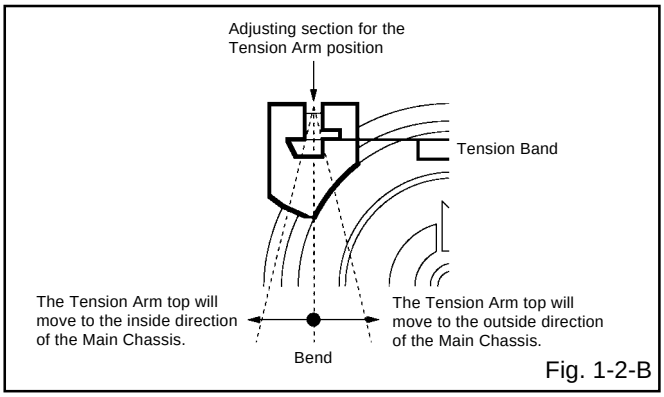


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(KT-300NR)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(KT-300NR)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

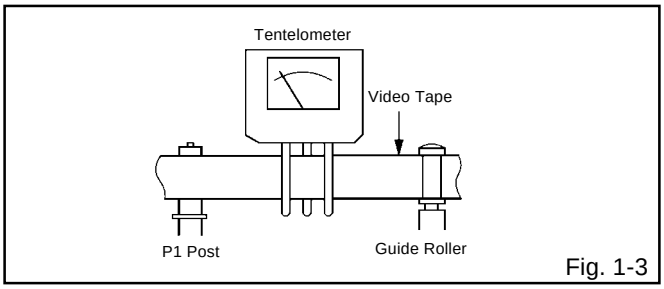


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4-B)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

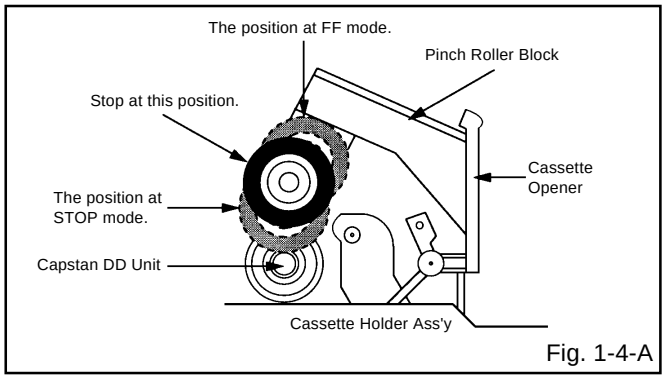


Fig. 1-4-A

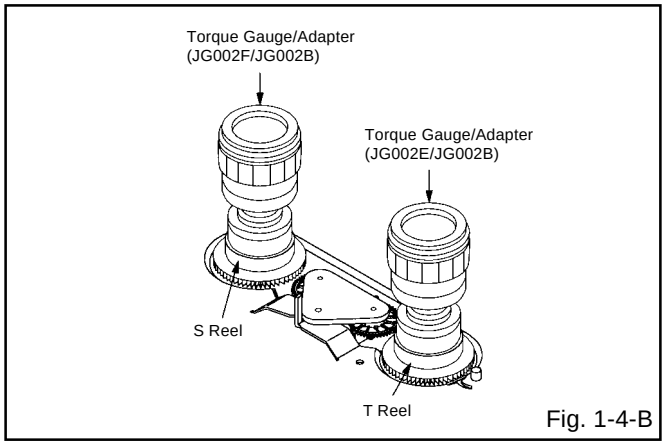


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4501 (Envelope)** and CH-2 to **TP102 (SW Pulse)**.
3. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control for more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat.
   Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback.
   (Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

After adjustment, confirm and adjust A/C head.
(Refer to item 2-2)

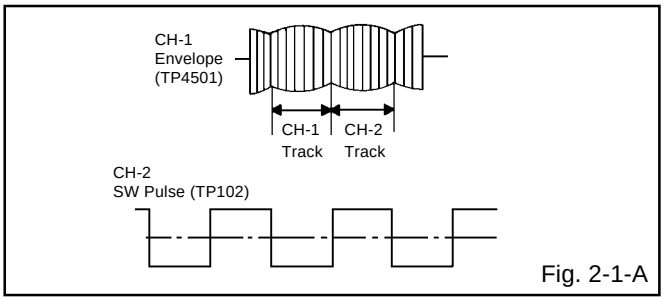


Fig. 2-1-A

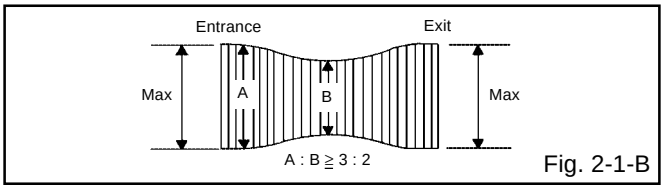


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

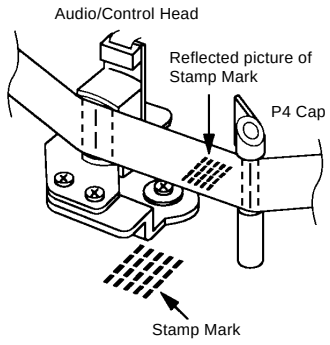


Fig. 2-2-A

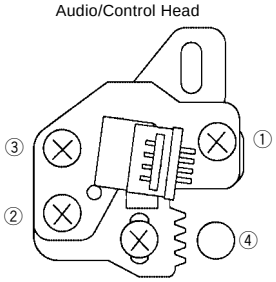


Fig. 2-2-B

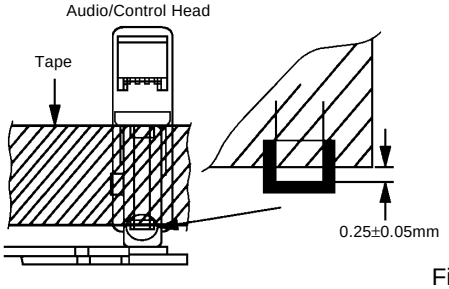


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP102**, CH-2 to **TP4501** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control for more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

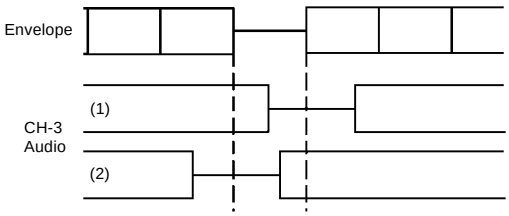
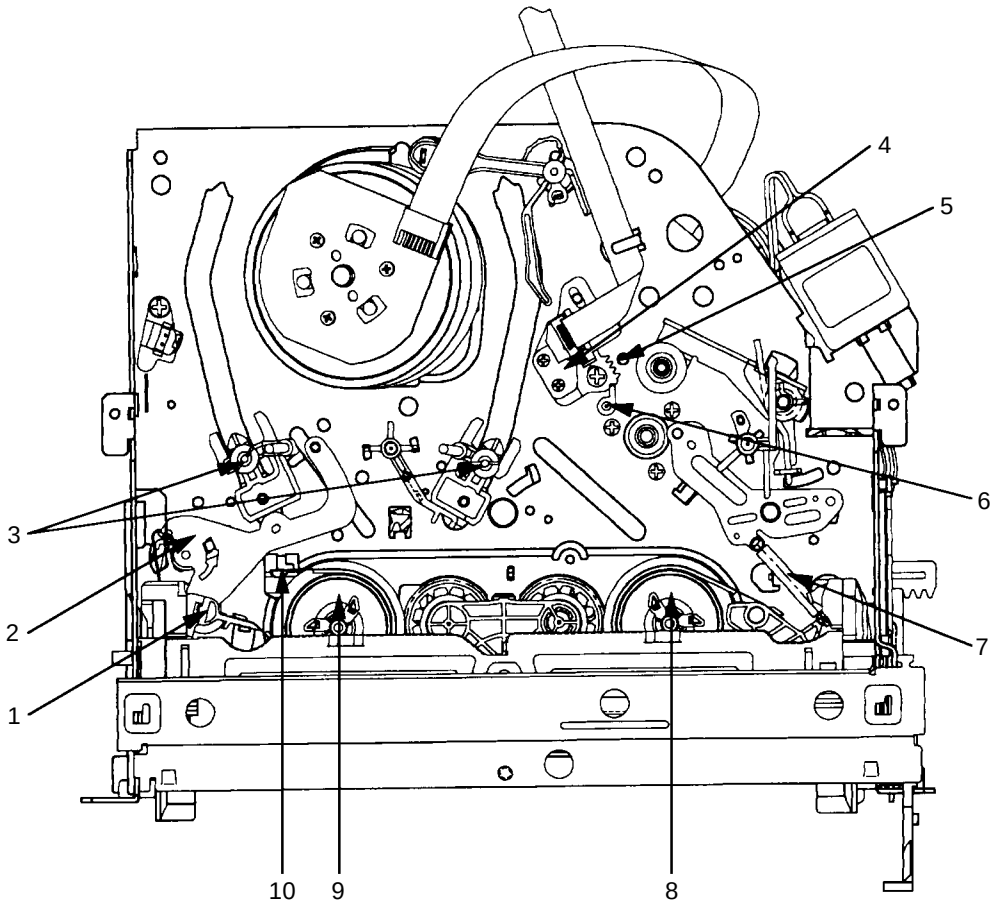


Fig. 2-3

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Connect
2. Tension Arm
3. Guide Roller
4. Audio/Control Head
5. X value adjustment driver hole
6. P4 Post
7. T Brake Spring
8. T Reel
9. S Reel
10. Adjusting section for the Tension Arm position

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor).

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

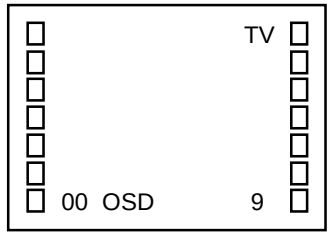


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	20	CONT CENT
01	OSD C	21	CONT MAX
02	CUT OFF	22	CONT MIN
03	H.POSI	23	COL CENT
04	H.BLK L	24	COL MAX
05	H.BLK R	25	COL MIN
06	V.SIZE	26	TINT
07	V.POSI	27	SHARP
08	V.LIN	28	SUB BIAS
09	VS.CORR	29	H.SIZE
10	V.COMP	30	PARABOLA
11	R.BIAS	31	TRAPEZIUM
12	G.BIAS	32	COR TOP
13	B.BIAS	33	COR BTM
14	R.DRV	34	H.COMP
15	G.DRV	35	T.STE
16	B.DRV	36	X-RAY
17	BRI CENT	37	H.STOP
18	BRI MAX	38	H.FREQ
19	BRI MIN	88	READ DATA

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP102** and CH-2 to **TP4201**.
2. Playback the alignment tape.
3. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control for more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control for more than 2 seconds until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control for more than 2 seconds until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control for more than 2 seconds and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H.
(Refer to Fig. 2-1-A, B)

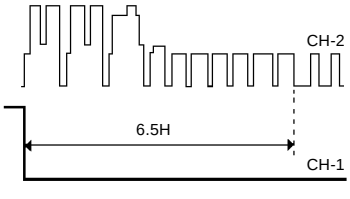


Fig. 2-1-A

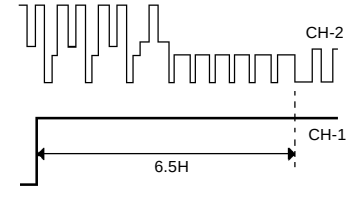


Fig. 2-1-B

ELECTRICAL ADJUSTMENTS

(TV SECTION)

2-2: CONSTANT VOLTAGE

1. Set condition is AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Connect the digital voltmeter to **TP401**.
4. Adjust the **VR1701** until the digital voltmeter is 114 ± 0.5V.

2-3: CUT OFF

1. Adjust the unit to the following settings.
   R.BIAS=127, G.BIAS=127, B.BIAS=127, R.DRV=63, G.DRV=07, B.DRV=63,
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-4: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(11)** on the remote control to select "R.BIAS".
5. Press the CH. UP/DOWN button on the remote control to select the "R.BIAS", "G.BIAS", "B.BIAS", "R.DRV", "B.DRV" or "G.DRV".
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R.BIAS, G.BIAS, B.BIAS, R.DRV, B.DRV, and G.DRV at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

2-5: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-6: HORIZONTAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "H.POSI".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-7: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V.POSI".
4. Check if the step No. V.POSI is "02".
5. Adjust the **VR404** until the horizontal line becomes fit to the notch of the shadow mask.

2-8: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V.SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.

2-9: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-8. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(08)** on the remote control to select "V.LIN".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-10: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-2)**

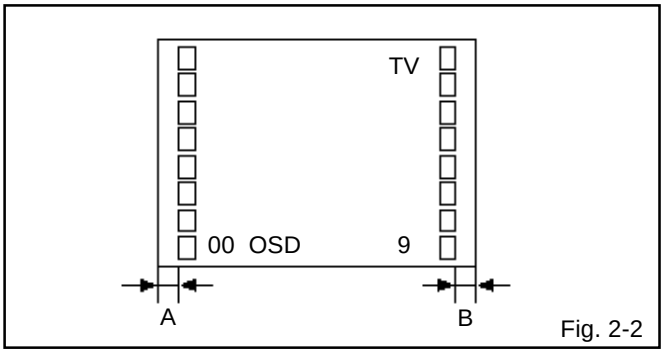


Fig. 2-2

ELECTRICAL ADJUSTMENTS

2-11: SUB BRIGHT CENTER

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the DVD button on the remote control to set to the DVD mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-12: SUB TINT CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP803**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(26)** on the remote control to select "TNT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line **(Refer to Fig. 2-3)**.
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.
8. Press the DVD button on the remote control to set to the DVD mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(26)** on the remote control to select "TNT".
10. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

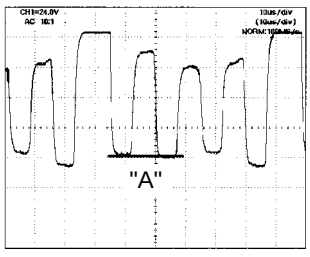


Fig. 2-3

2-13: SUB COLOR CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP802**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COL CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 85 ± 5% of the white level. **(Refer to Fig. 2-4)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.
9. Press the DVD button on the remote control to set to the DVD mode.
10. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COL CENT".
11. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

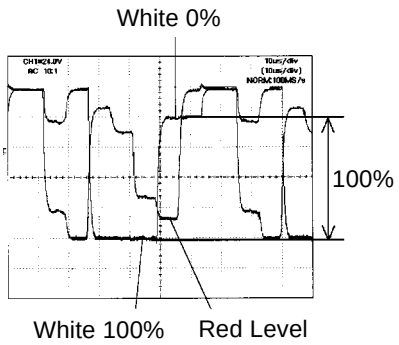


Fig. 2-4

ELECTRICAL ADJUSTMENTS

2-14: SUB CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "CONT MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "91".
3. Receive a broadcast and check if the picture is normal.
4. Press the INPUT SELECT button on the remote control to set to the AV mode.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "CONT MAX".
6. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "91".
7. Receive a broadcast and check if the picture is normal.
8. Press the DVD button on the remote control to set to the DVD mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "CONT MAX".
10. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-15: Confirmation of Fixed Value (step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	RF	AV	DVD
01	OSD C	03	03	03
04	H.BLK L	02	02	02
05	H.BLK R	02	02	02
09	VS.CORR	07	07	07
10	V.COMP	03	03	03
15	G.DRV	07	07	07
18	BRI MAX	100	100	100
19	BRI MIN	25	25	25
20	CONT CENT	50	50	50
22	CONT MIN	15	15	15
24	COL MAX	127	127	127
25	COL MIN	00	00	00
27	SHARP	30	30	15
28	SUB BIAS	30	30	30
29	H.SIZE	00	00	00
30	PARABOLA	00	00	00
31	TRAPEZIUM	00	00	00
32	COR TOP	00	00	00
33	COR BTM	00	00	00
34	H.COMP	00	00	00
35	T.STE	00	00	00
38	H.FREQ	63	63	63

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

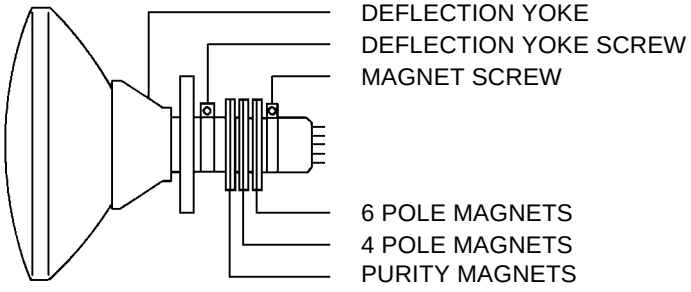


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

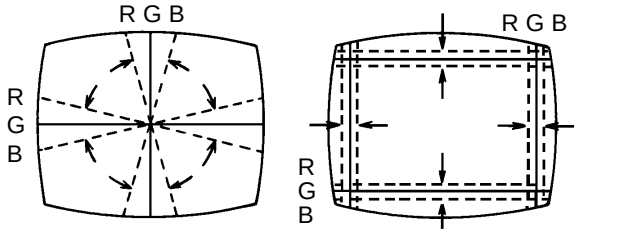
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

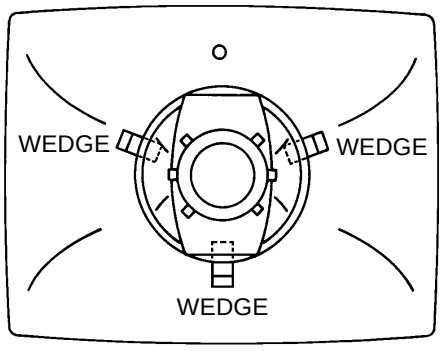
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

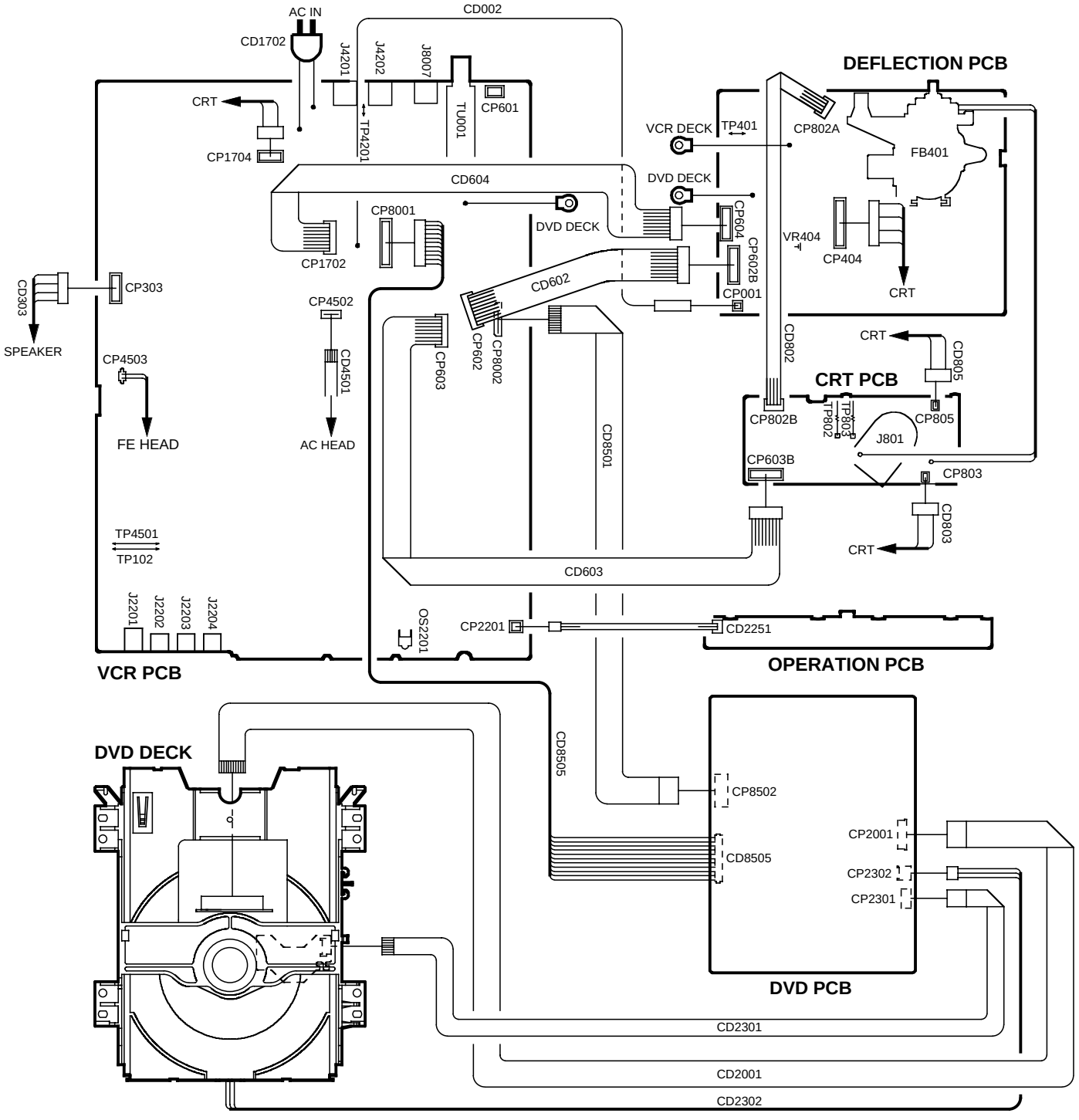


WEDGE POSITION

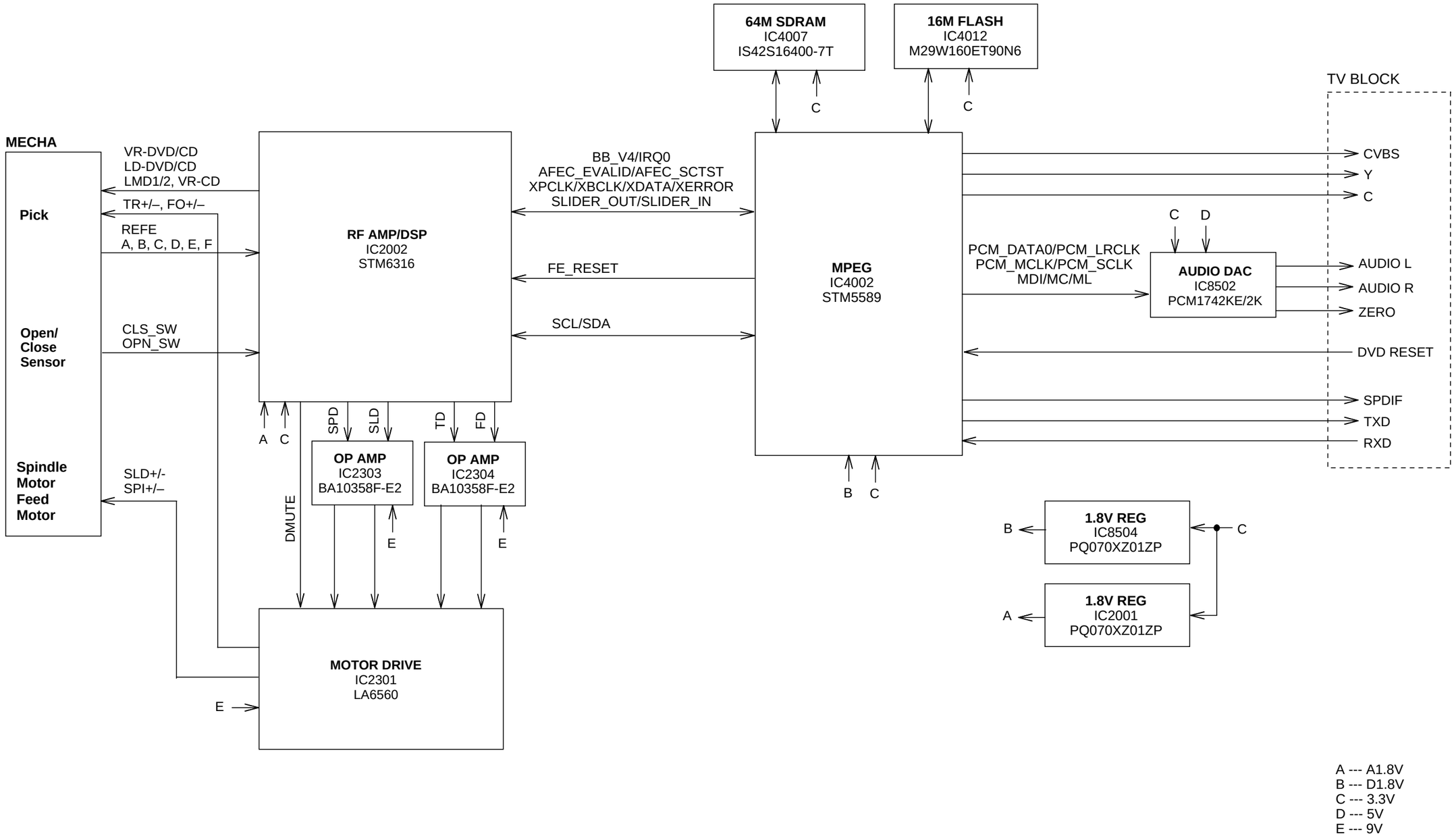
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)

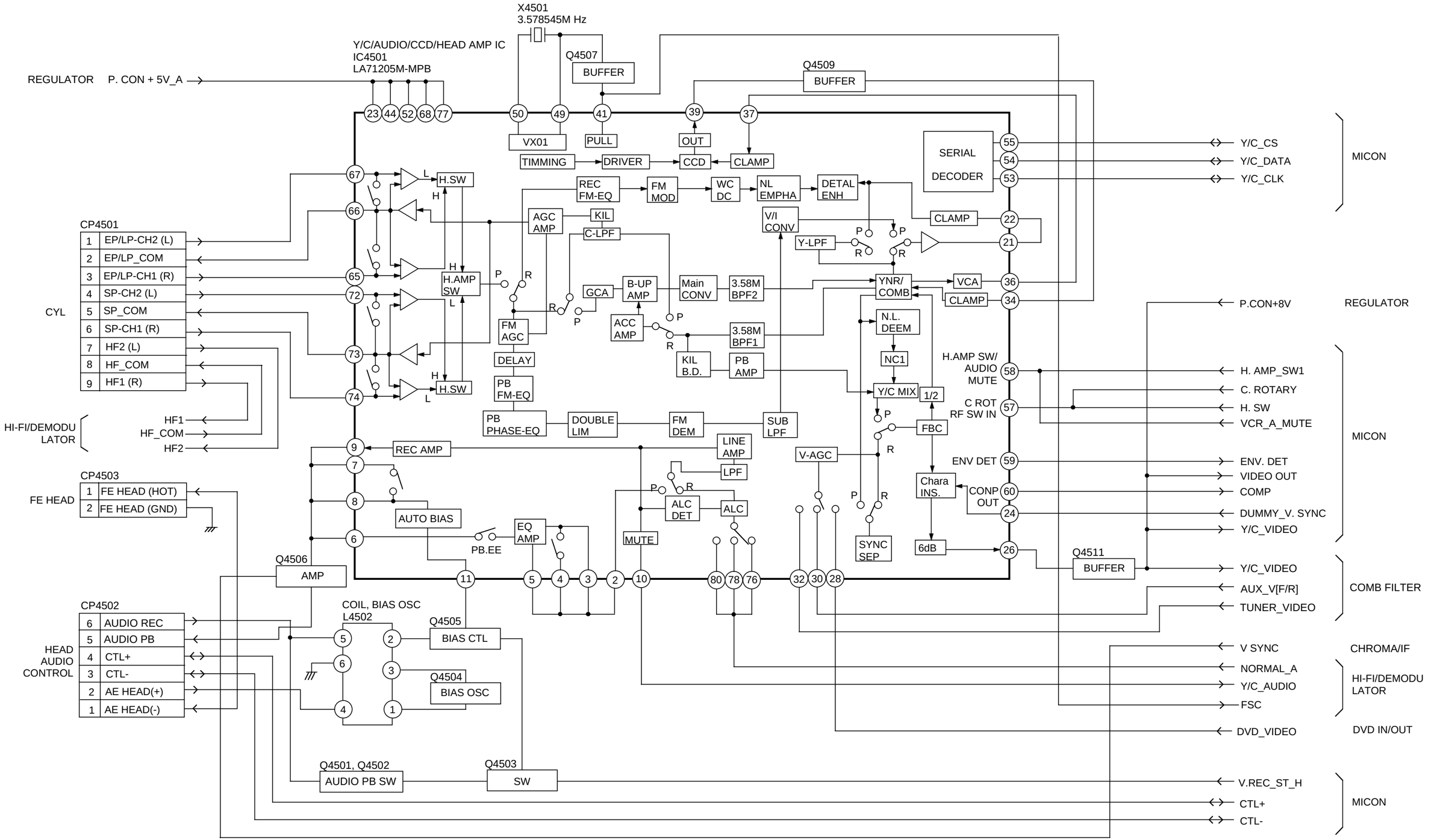


DVD ST SOLUTION BLOCK DIAGRAM

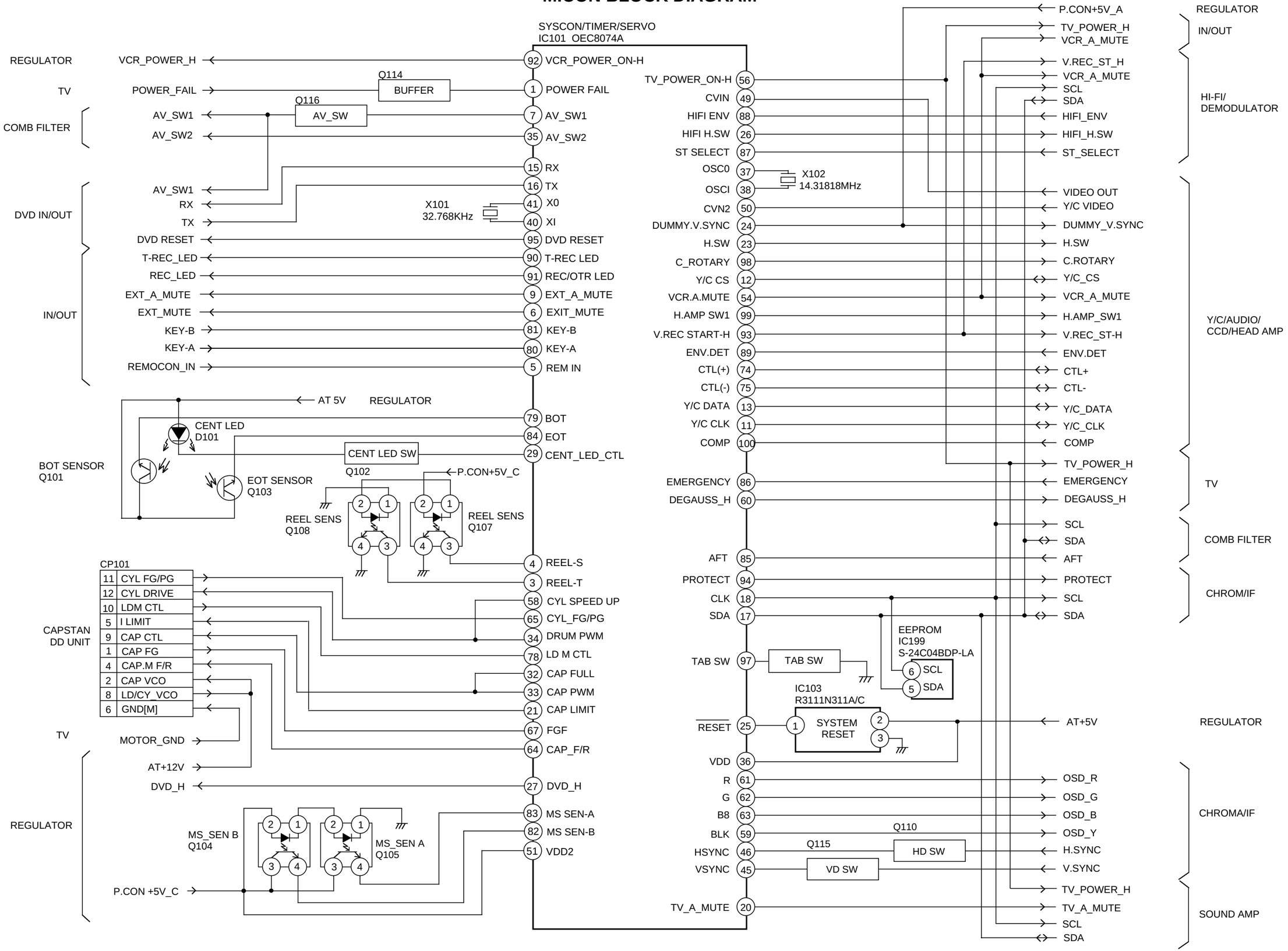


A --- A1.8V
B --- D1.8V
C --- 3.3V
D --- 5V
E --- 9V

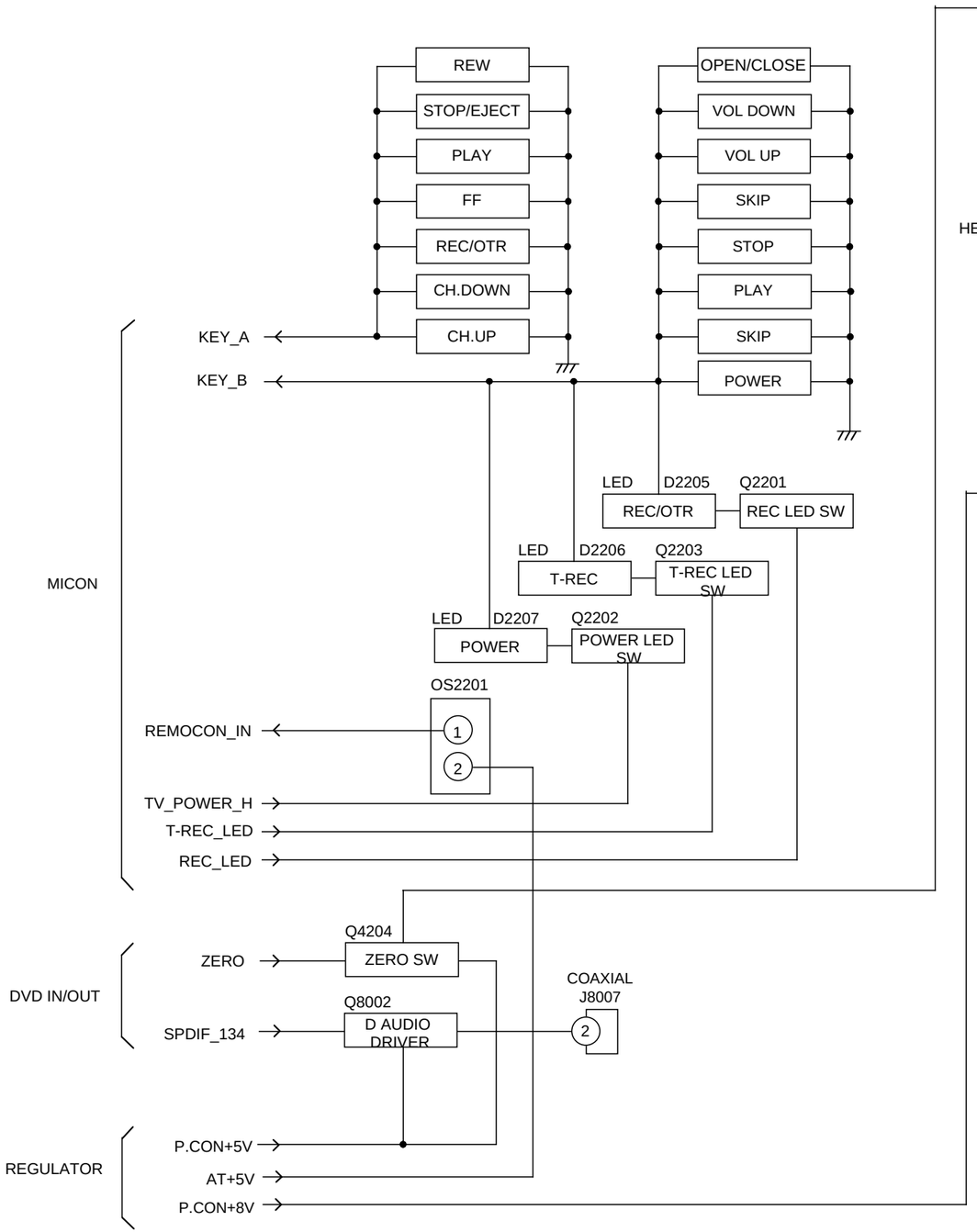
Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM

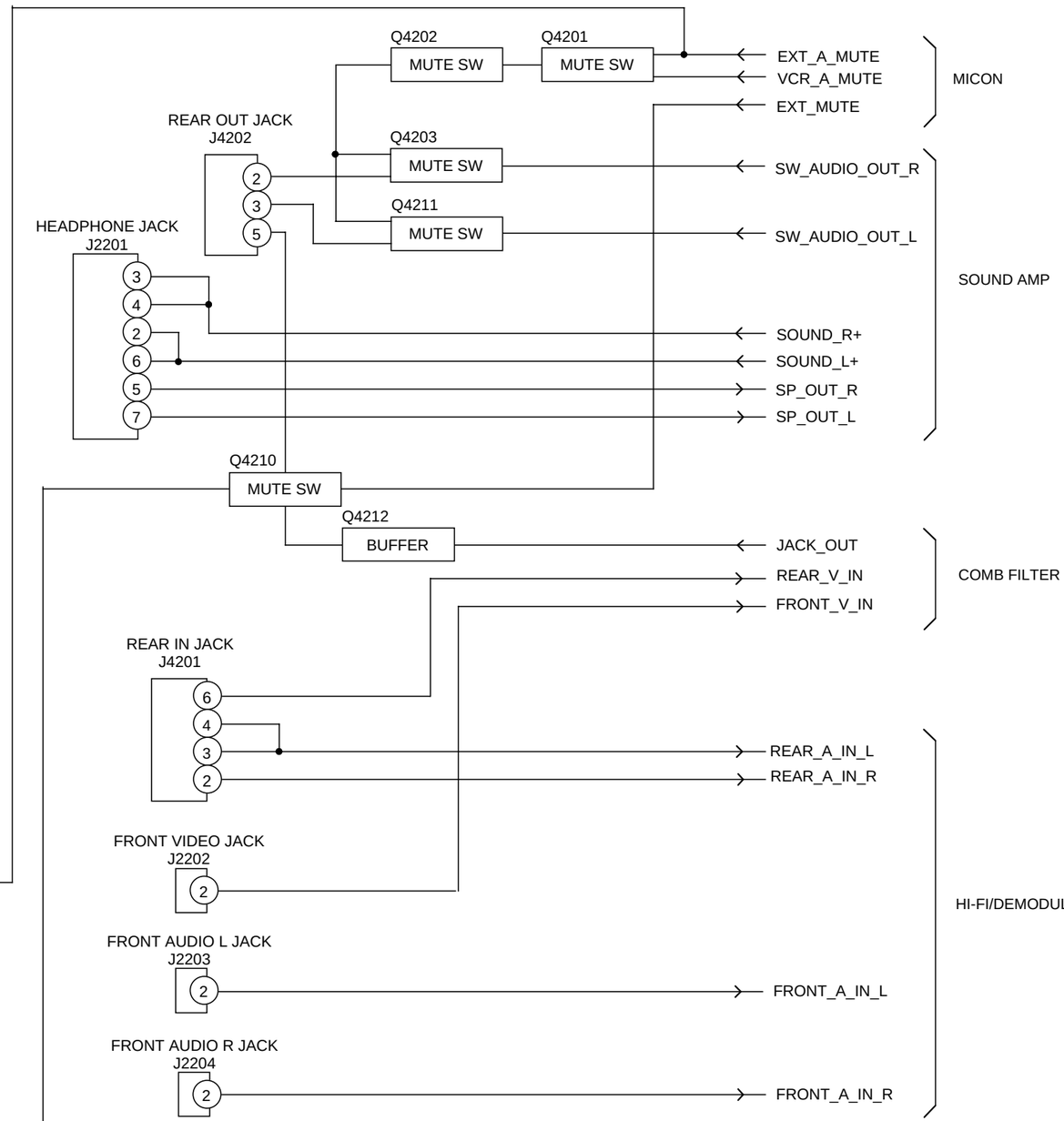


MICON BLOCK DIAGRAM

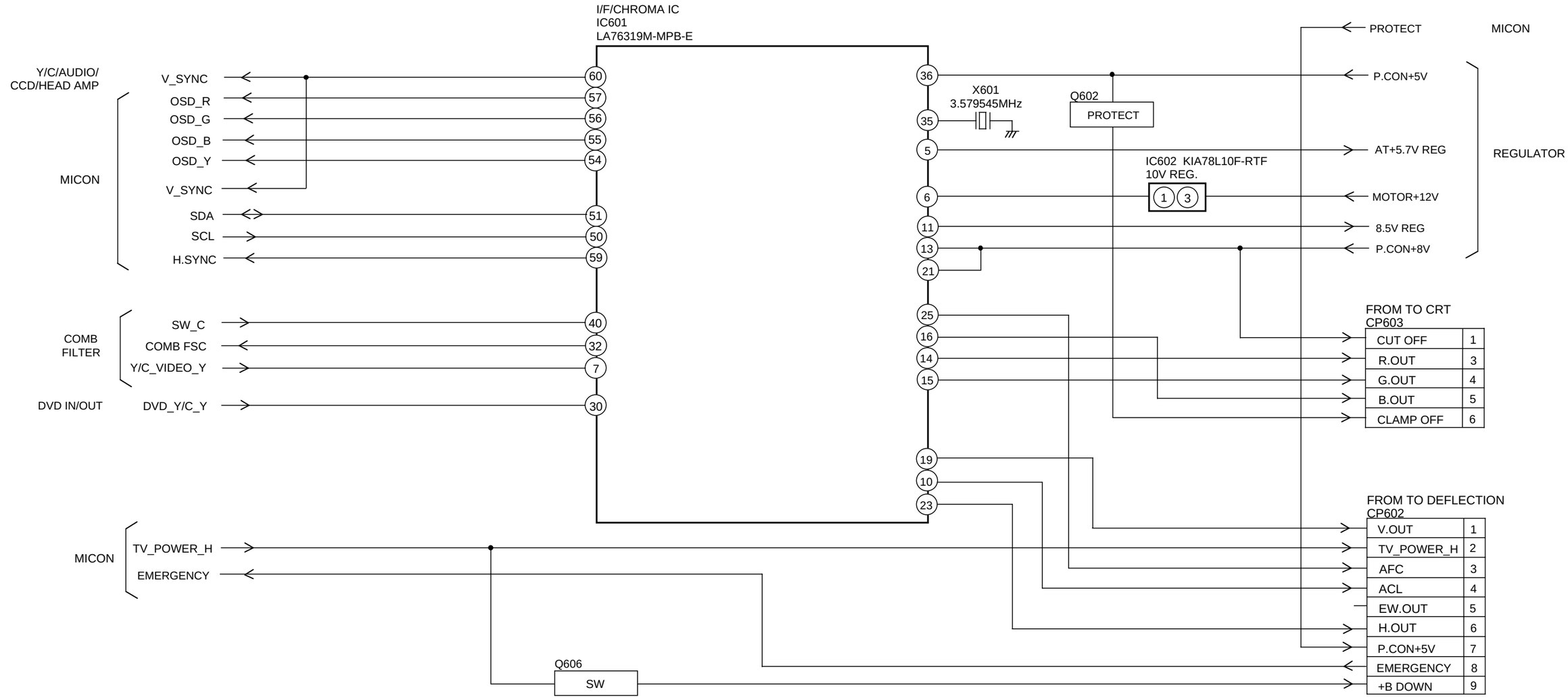


IN/OUT BLOCK DIAGRAM

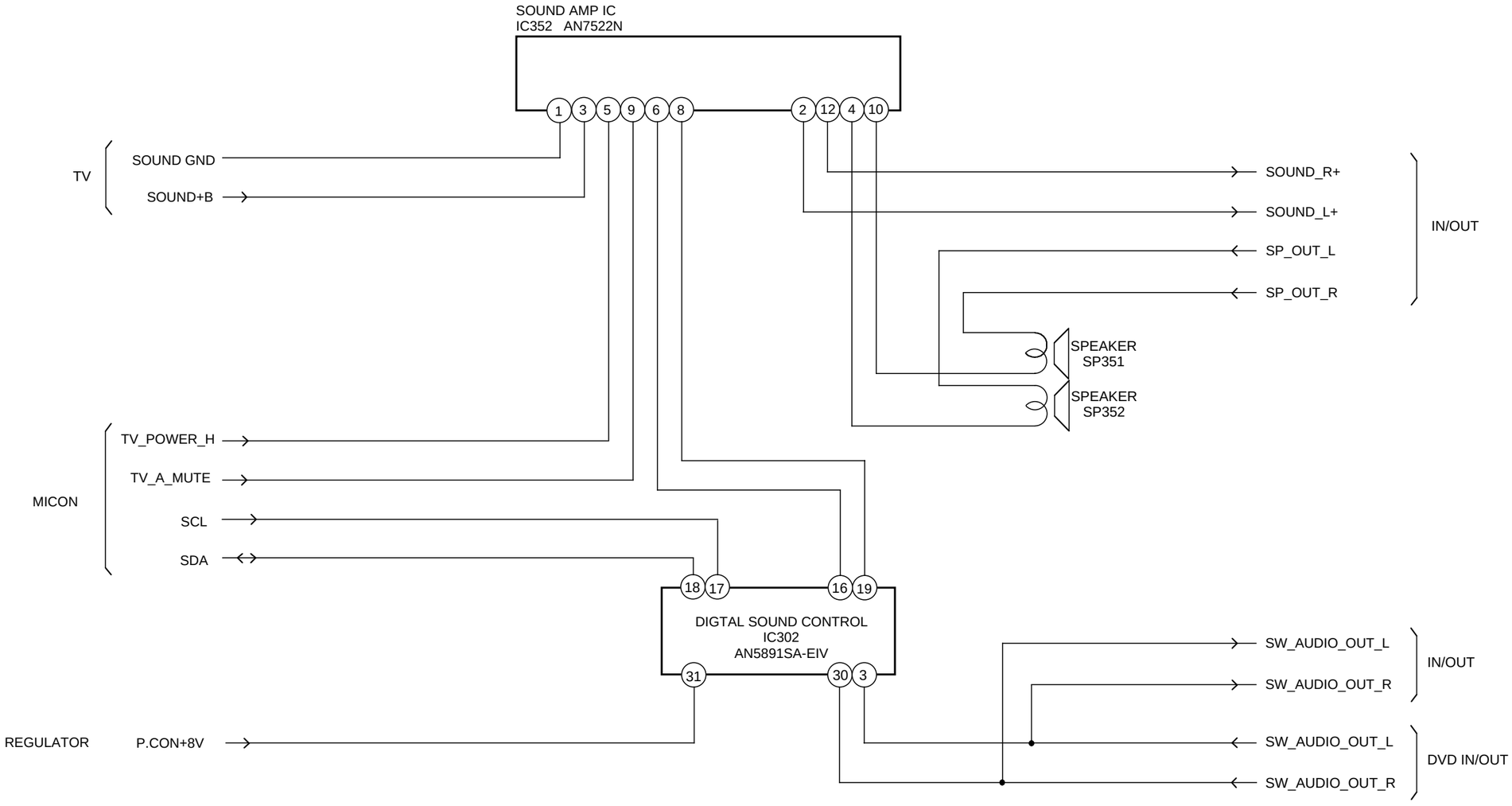




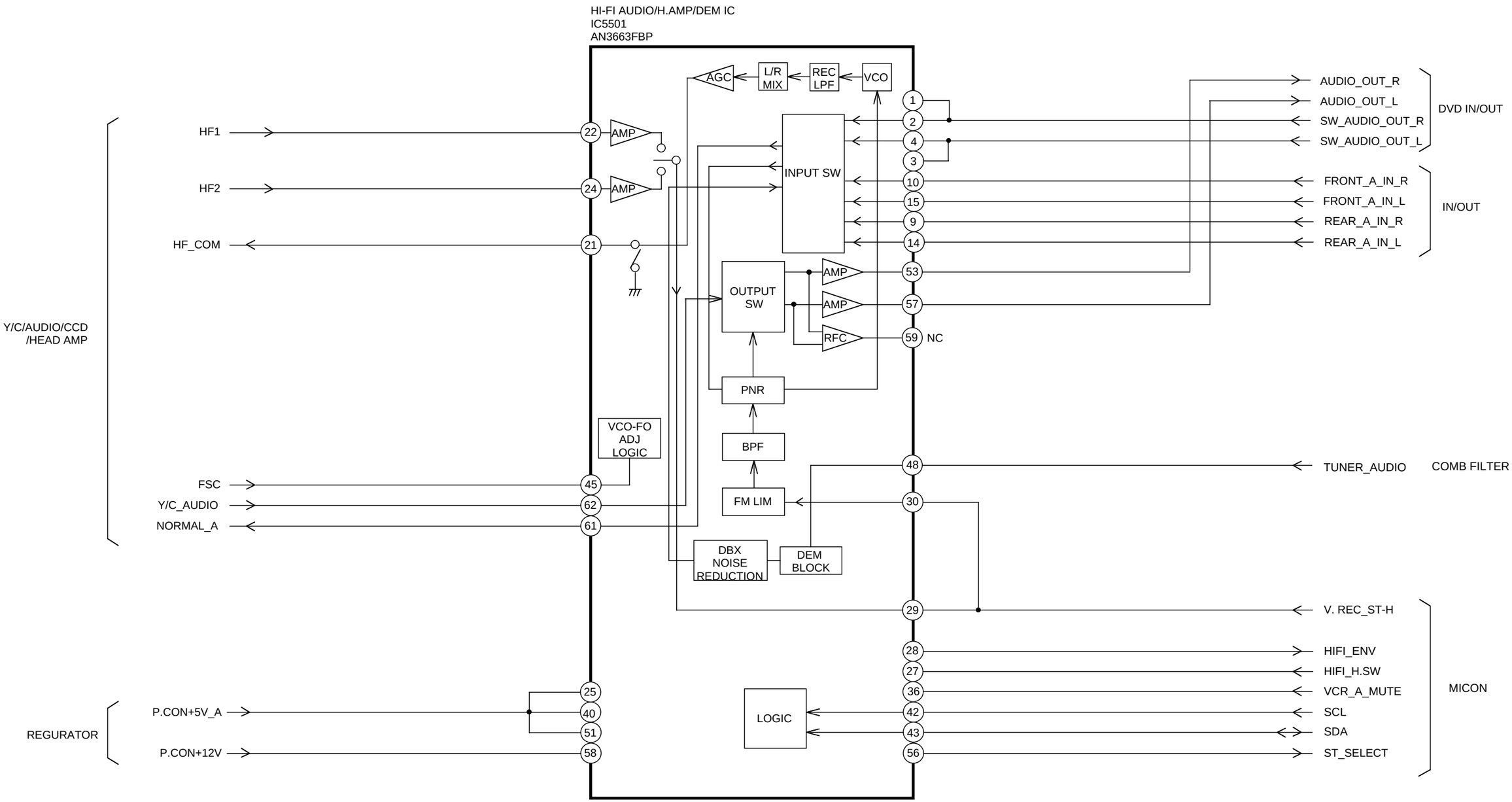
CHROMA/IF BLOCK DIAGRM



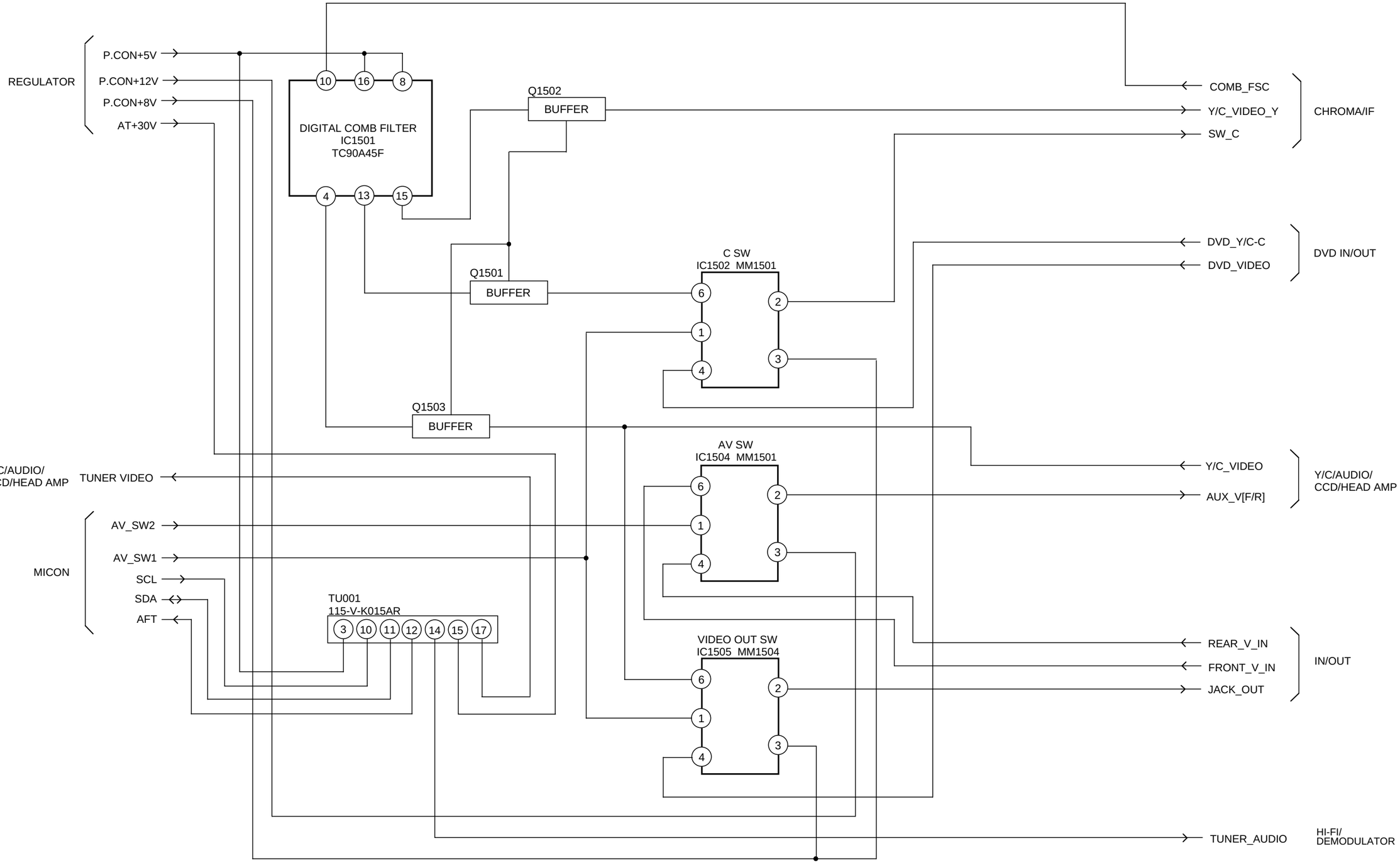
SOUND AMP BLOCK DIAGRAM



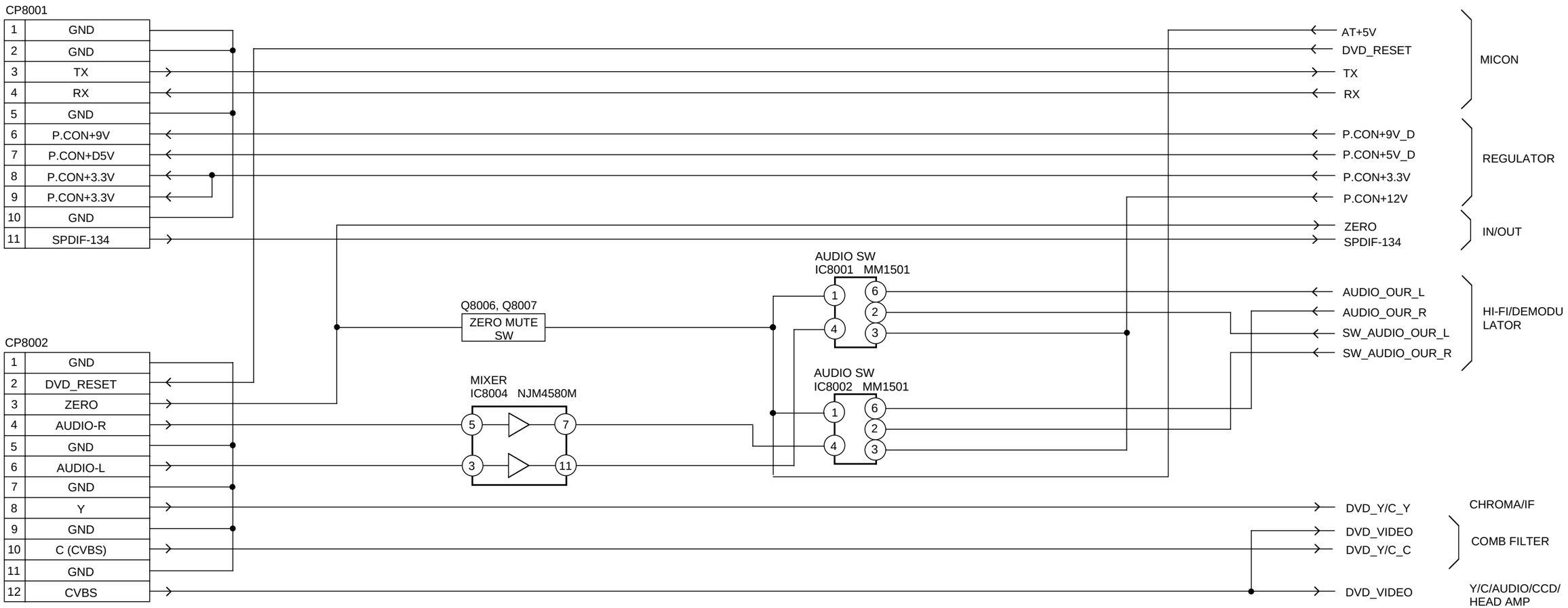
Hi-Fi/DEMODULATOR BLOCK DIAGRM



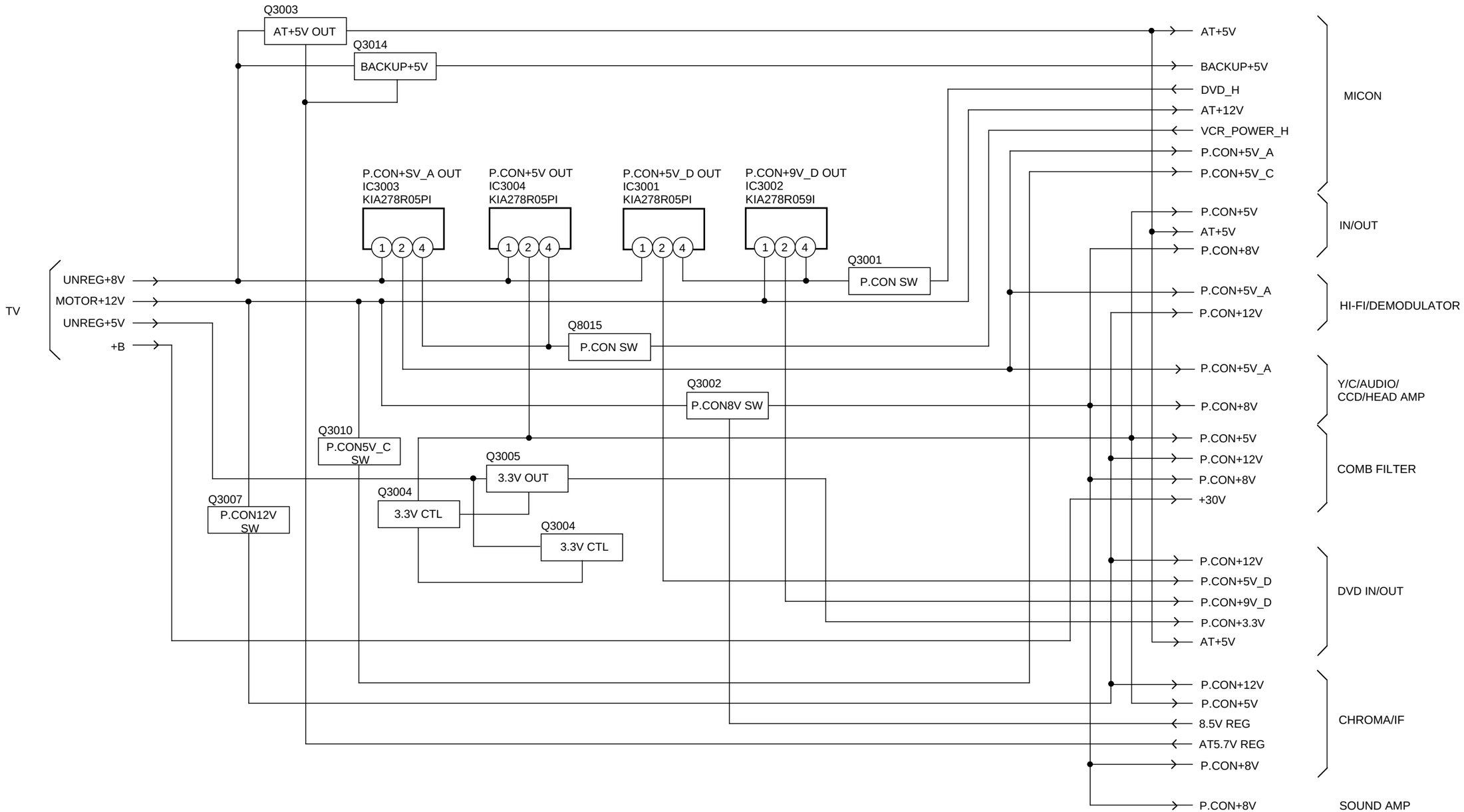
COMB FILTER BLOCK DIAGRAM



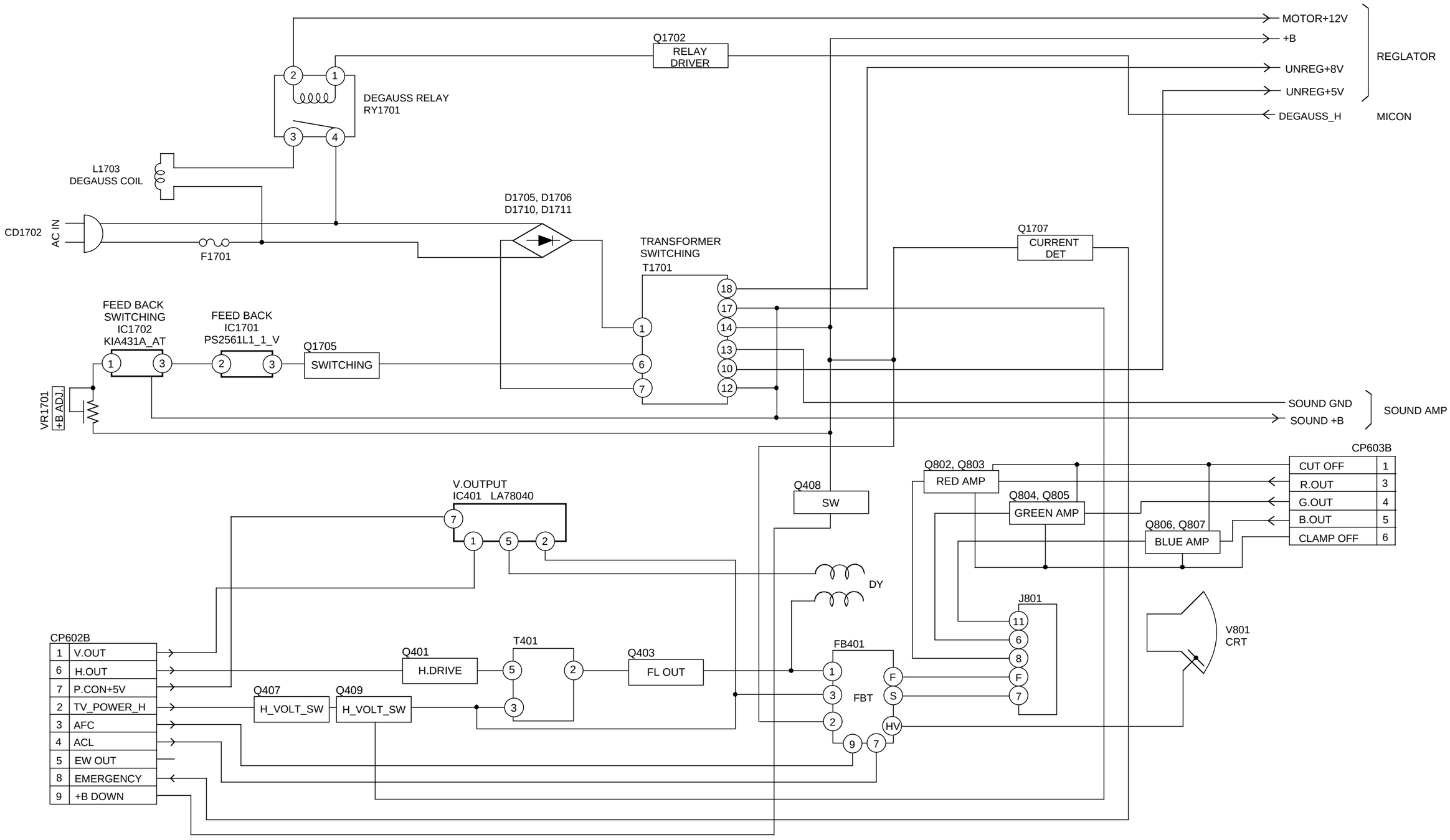
DVD IN/OUT BLOCK DIAGRAM



REGULATOR BLOCK DIAGRAM

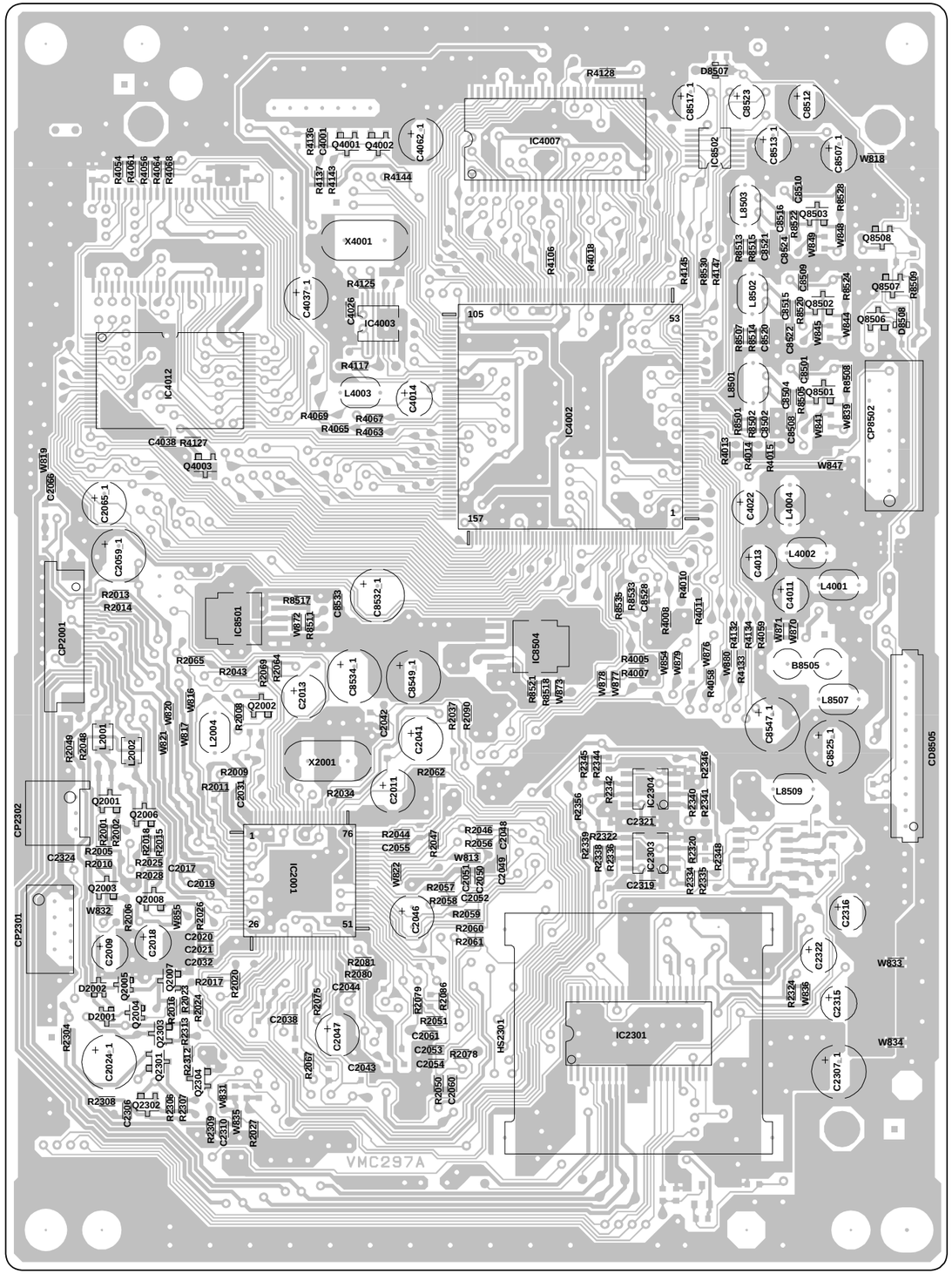


TV BLOCK DIAGRAM

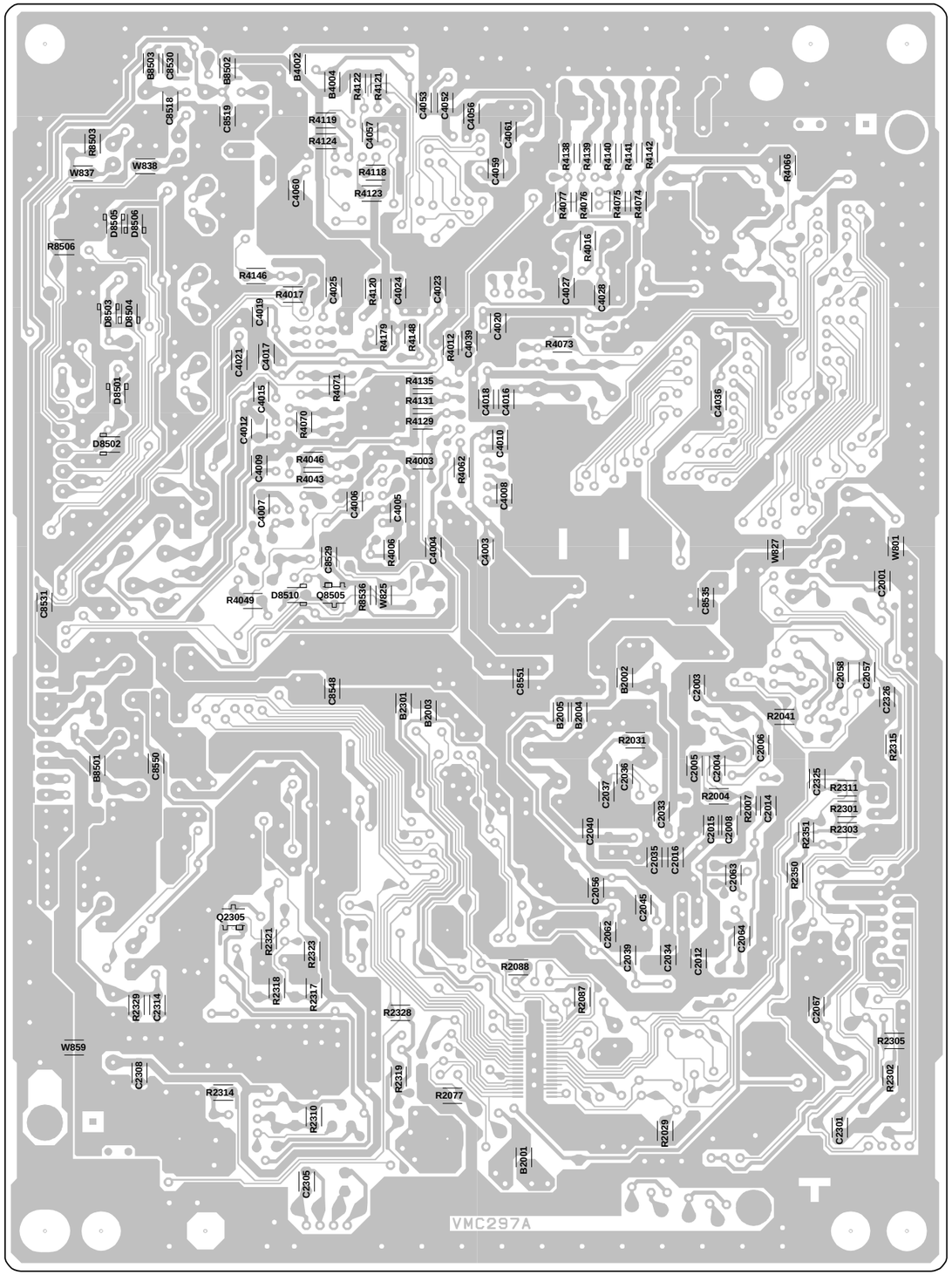


PRINTED CIRCUIT BOARDS

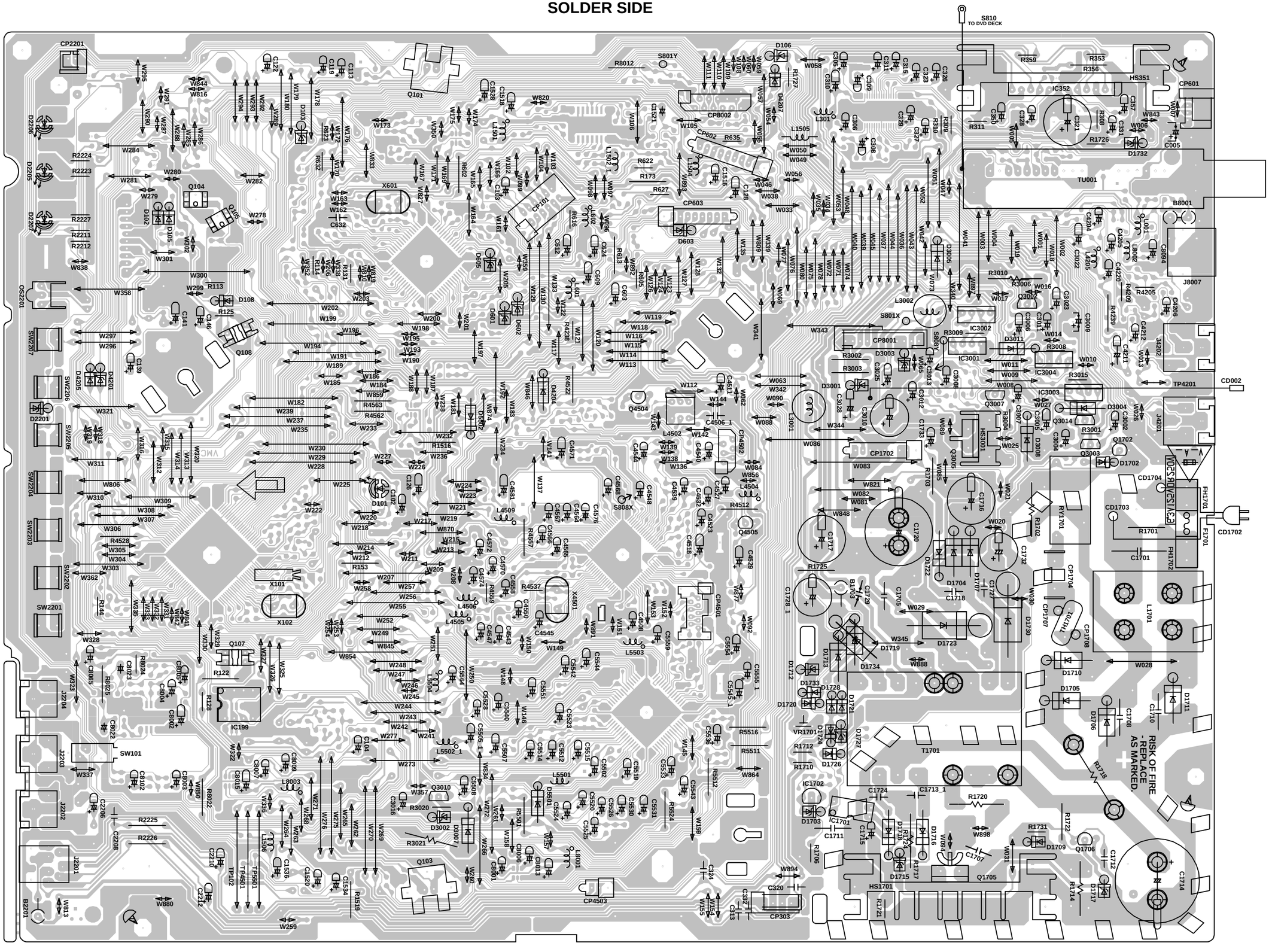
DVD (TOP SIDE)



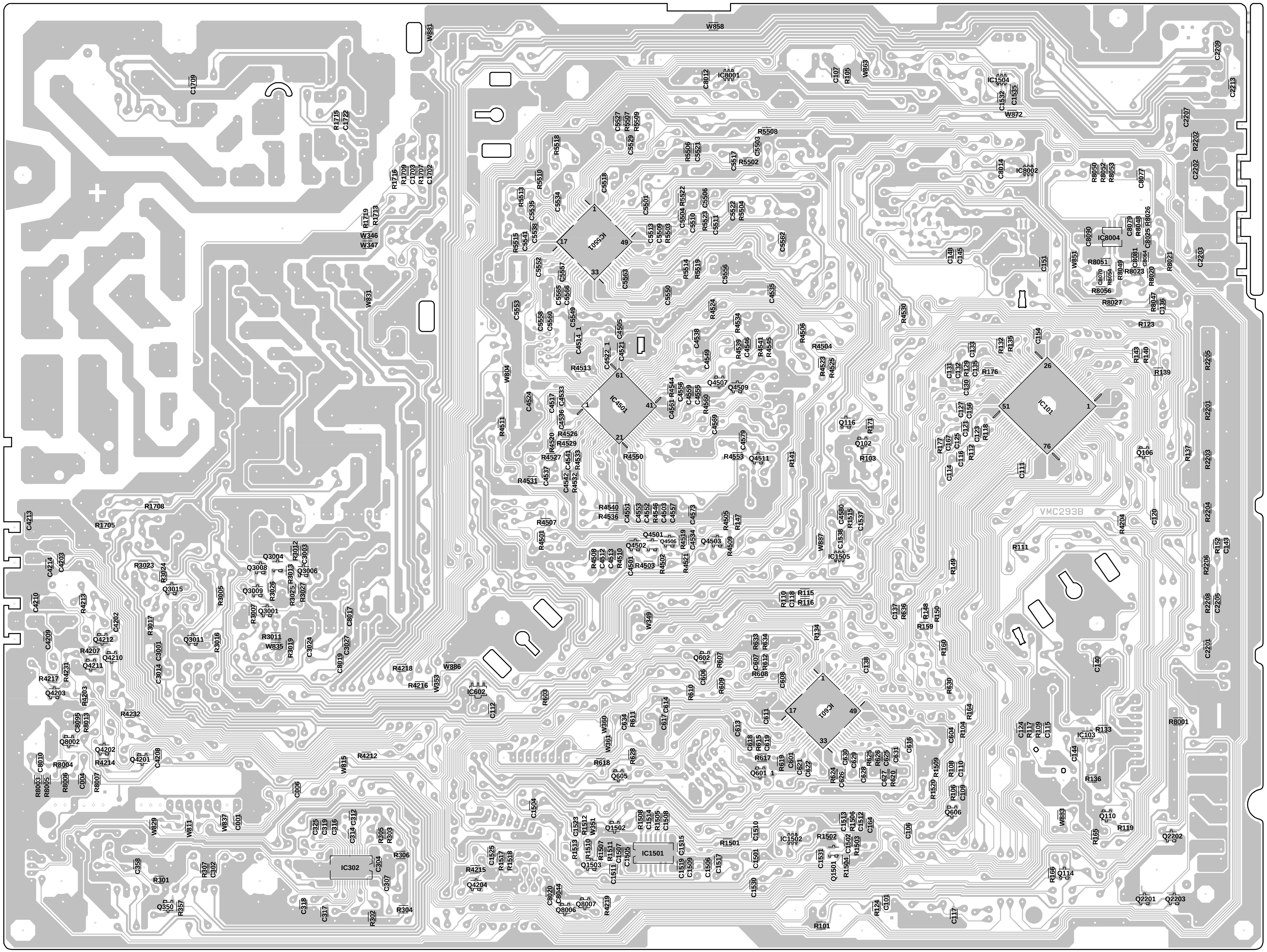
DVD (BOTTOM SIDE)



PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE

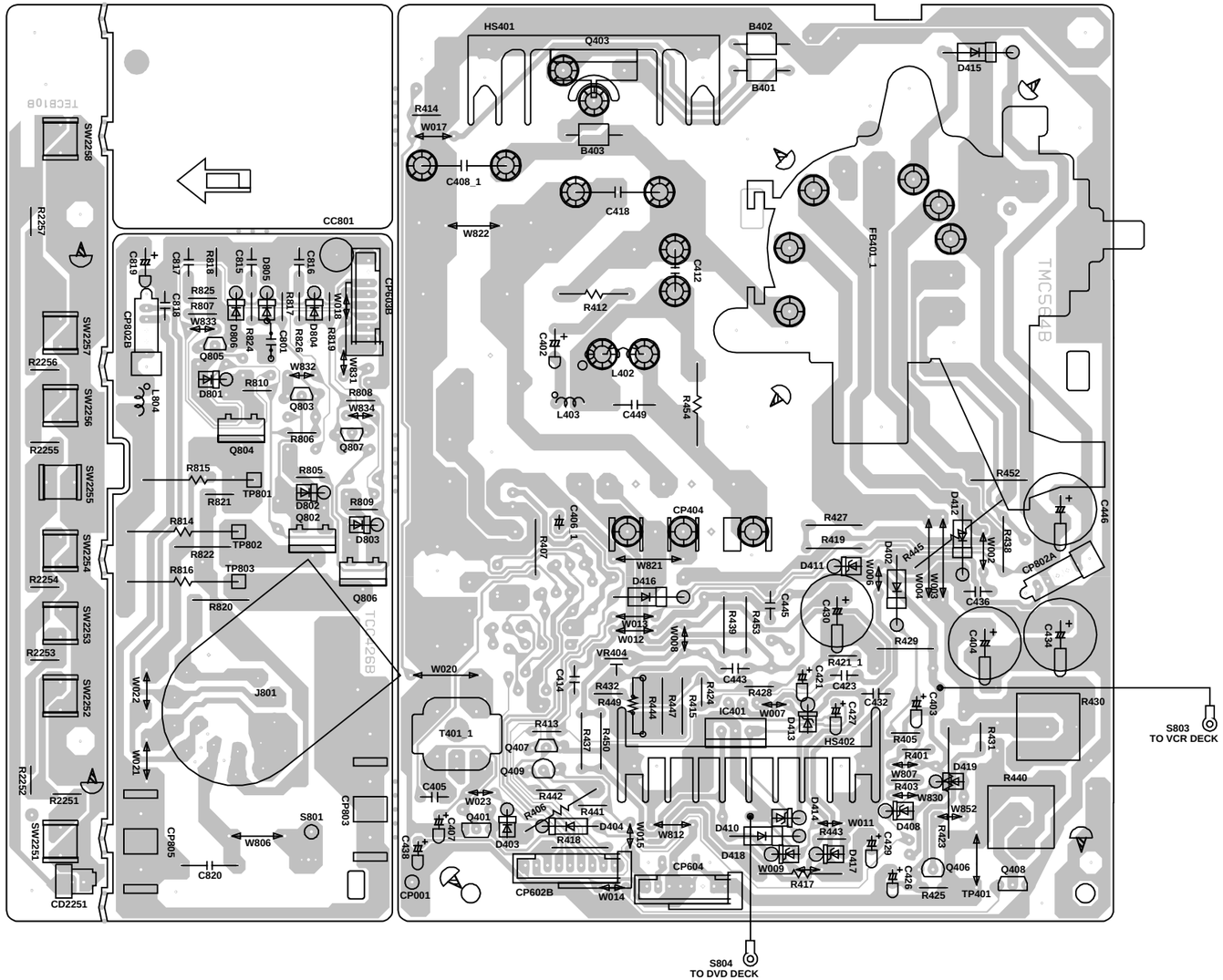


PRINTED CIRCUIT BOARDS
VCR (CHIP MOUNTED PARTS)
SOLDER SIDE

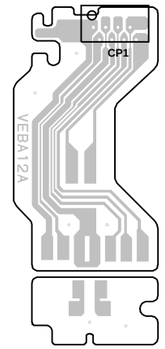


PRINTED CIRCUIT BOARDS

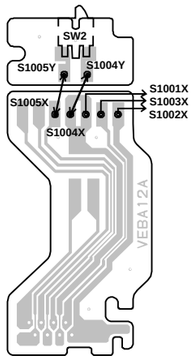
DEFLECTION/CRT/OPERATION
SOLDER SIDE



RELAY/SW (INSERTED PARS)
SOLDER SIDE



RELAY/SW (CHIP MOUNTED PARS)
SOLDER SIDE



RF_AMP/DSP SCHEMATIC DIAGRAM

(DVD PCB)

FFC(P=0.5mm)
CD2001
DVD_LOADER_FFC

FROM/TO LOADER

CP2001
IMSA-9631S-24Y901

24	T-	TR+
23	T+	TR-
22	F-	FO+
21	F+	FO-
20	MON(DVD)	LMD1
19	NC(SW)	NC
18	VOL(DVD)	VR-DVD
17	GND(DVD)	
16	LD(DVD)	LD-DVD
15	LD(CD)	LD-CD
14	VOL(CD)	VR-CD
13	GND(CD)	
12	MON(COM)	LMD2
11	GND(NC)	NC
10	RF	TP2007
9	C	C
8	B	B
7	A	A
6	D	D
5	F	F
4	E	E
3	VCC	
2	Vref	REFD
1	GND(PDIC)	

FROM REGULATOR2

P.CON+A5V
P.CON+A1.8V
P.CON+3.3V
GND
D_GND

B2001 FCM2012H-102T04
B2002 FCM2012H-102T04
B2003 FCM2012H-102T04
B2004 FCM2012H-102T04
B2005 FCM2012H-102T04

+3.3VA
+1.8VA
+3.3VD
+1.8VD

DVD JG2001
VCC5 JG2002
CD JG2004

DVD_LD CTL Q2001 2SA1036K
CD_LD CTL Q2006 2SA1036K
Q2003 LCD_CTL KTC3875S_Y_RTK
Q2008 LD_CTL KTC3875S_Y_RTK
W832
W855
W801
W827
W819
W816
W817
W820
W821
W813
W822
W831

D2001 KDS121RTK
D2002 KDS120RTK
CD_CTL Q2005 2SK3018
DVD_CTL Q2004 2SK3018
Q2007 DPD_TE_CTL KTC3875S_Y_RTK
BUFFER Q2002 2SA1037AK

X2001 20MHz 100BT02003

TP2001
TP2002
TP2003
TP2004
TP2005
TP2006

RF AMP/DSP IC
IC2001
STM6316ATXXZ

1	IREF	24	GNDADC
2	GNDAI	25	VSHIELDADC
3	RFIN	26	VCC33DAC
4	RFOUT	27	GNDDAC
5	VCCA18	28	SPINDLE
6	A	29	SLEDGE
7	GNDMN	30	REFEXT
8	B	31	REFGND
9	VCC33MN	32	REFDAC
10	REFD	33	FACT
11	VCC18MN	34	TACT
12	D	35	VCC18DAC
13	VCC18IS	36	PC(0)
14	C	37	PC(1)
15	VCC33IS	38	PC(2)
16	GNDAIS	39	PC(3)
17	VCC33SD	40	PC(4)
18	VCC18SD	41	VSS(ESD5)
19	GNDSD	42	VDD33
20	F	43	PC(5)
21	E	44	PC(6)
22	VSHIELDIS	45	PC(7)
23	VCC18ADC	46	PD(7)
24	PD(3)	47	VSS(ESD5)
25	PD(4)	48	VDD18
26	PD(5)	49	PD(6)
27	PD(6)	50	PD(5)
28	PD(7)	51	PD(4)
29	VSS(ESD5)	52	PD(3)
30	VDD18	53	PD(2)
31	PD(1)	54	PD(1)
32	PD(0)	55	PD(0)
33	VSS(COMP)	56	VSS(COMP)
34	VDD33	57	VDD33
35	OUT_ERR	58	OUT_ERR
36	OUT_EVALID	59	OUT_EVALID
37	VSS(ESD5)	60	VSS(ESD5)
38	OUT_CLK	61	OUT_CLK
39	VDD18	62	VDD18
40	OUT_DVALID	63	OUT_DVALID
41	OUT_DATA	64	OUT_DATA
42	OUT_SYNC	65	OUT_SYNC
43	PE(5)	66	PE(5)
44	PE(4)	67	PE(4)
45	PE(3)	68	PE(3)
46	PE(2)	69	PE(2)
47	PE(1)	70	PE(1)
48	PE(0)	71	PE(0)
49	VDD18	72	VDD18
50	VSS(ESD5)	73	VSS(ESD5)
51	PG(1)	74	PF(1)
52	PG(0)	75	PF(0)
53	TEST	76	VSS(ESD5)
54	RESET_N	77	VDD18
55	VSSDAC	78	PG(1)
56	VDD18DADC	79	PG(0)
57	GNDPLL	80	TEST
58	PLLOFF	81	RESET_N
59	FREOUT	82	VSSDAC
60	FRIEN	83	VDD18DADC
61	VCC18PLL	84	GNDPLL
62	LD1	85	PLLOFF
63	LD2	86	FREOUT
64	VCCA33	87	FRIEN
65	TWSEL	88	VCC18PLL
66	LMD1	89	LD1
67	LMD2	90	LD2
68	GNDL	91	VCCA33
69	TST_PM	92	TWSEL
70	TST_SLICE	93	LMD1
71	TST_ADC	94	LMD2
72	RFOUT	95	GNDL
73	RFIN	96	TST_PM
74	PC0I	97	TST_SLICE
75	DMUTE	98	TST_ADC
76	PC2I	99	RFSACD
77	CD-DVD	100	VBGFILT
78	CLS_SW		
79	LSW		
80	OPN_SW		

ICD
PG0 JG2009
PG1 JG2010
JG2011 D_GND
JG2012 +3.3VD
JG2003 FE_RESET

FROM/TO MPEG
FE_RESET
SCL
SDA
IRQ0
BB_V4
AFEC_EVALID
XDATA
XBCLK
XPCLK
AFEC_SCTST
XERROR

FROM/TO MOTOR DRV
OPN_SW
CLS_SW
DMUTE
SPD_FG
TD
FD
REFDAC
SLD
SPD
TR-
TR+
FO-
FO+
LSW
P.CON+M5V

FO ERR JG2005
TR ERR JG2006

JG2038
JG2039
JG2040
JG2041
JG2042

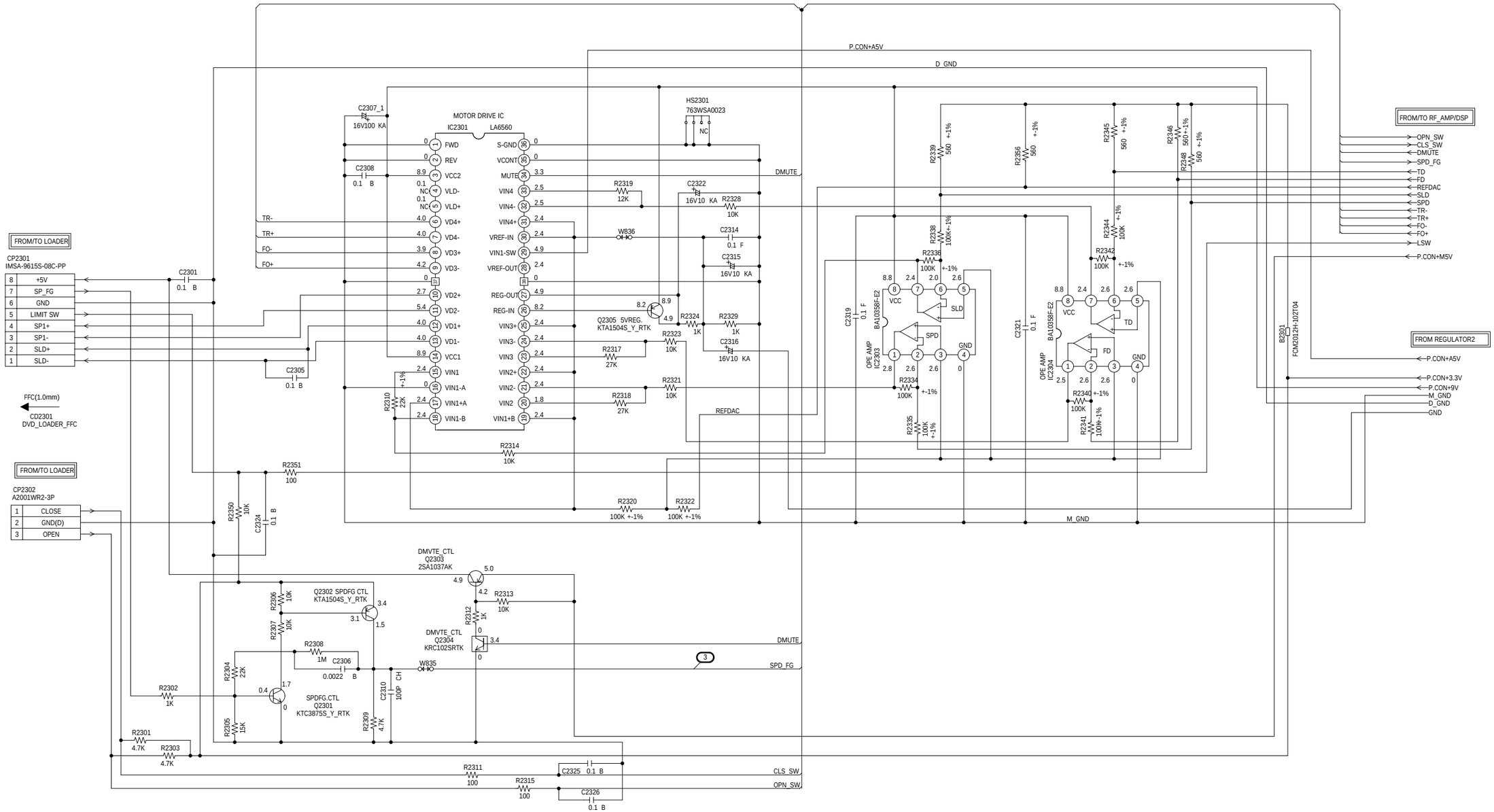
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB130
VMC297

MOTOR DRIVE SCHEMATIC DIAGRAM

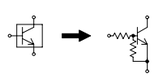
(DVD PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR



PCB130
VMC297

MPEG SCHEMATIC DIAGRAM

(DVD PCB)

MPEG IC
IC4002
STM5589AVA

CLOCK GENERATOR
IC4003 SN74AHCU04PWR

FROM/TO MEMORY

FROM/TO RF_AMP/DSP

FROM/TO REGULATOR2

FROM/TO AUDIO/VIDEO

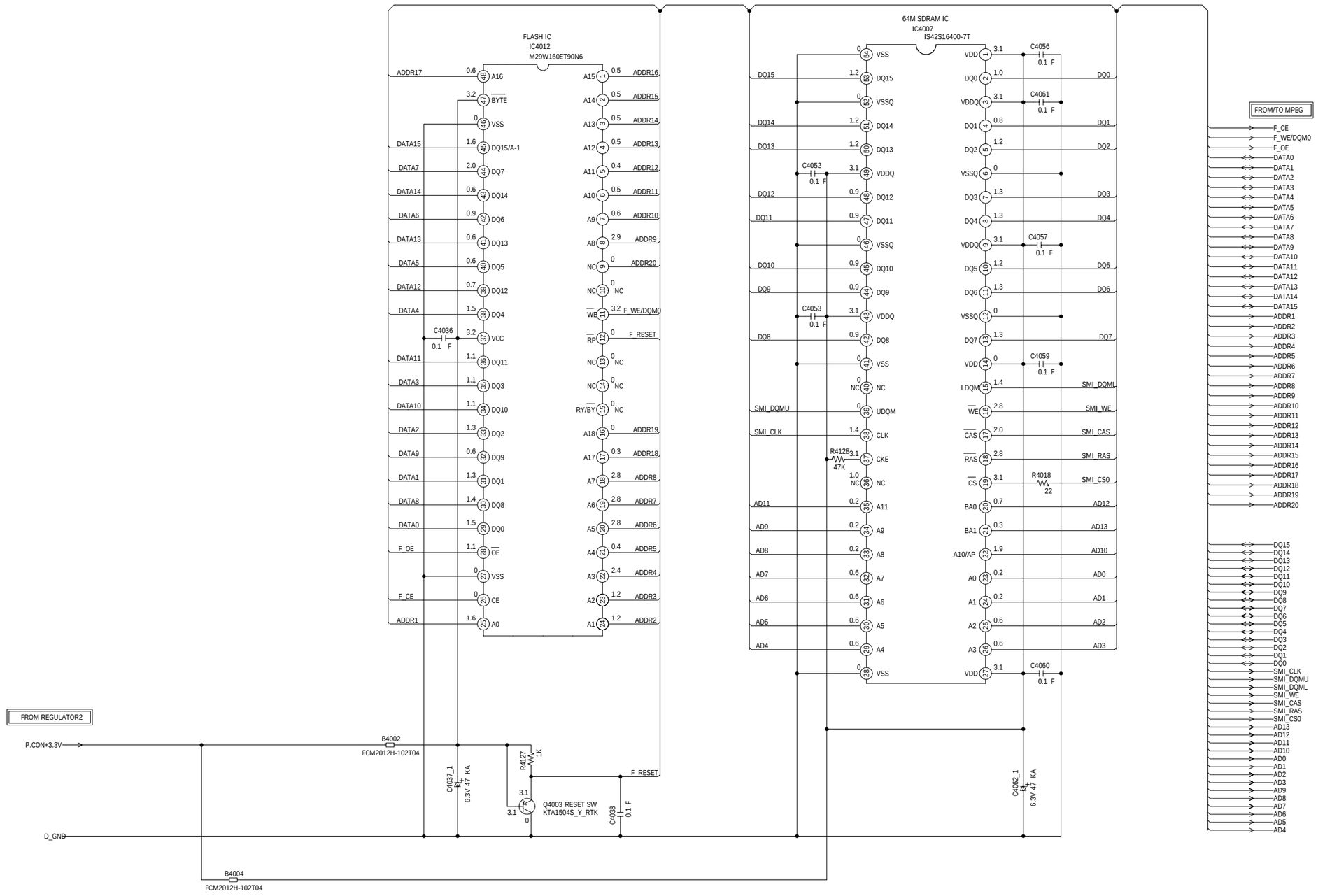
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB130
VMC297

MEMORY SCHEMATIC DIAGRAM

(DVD PCB)



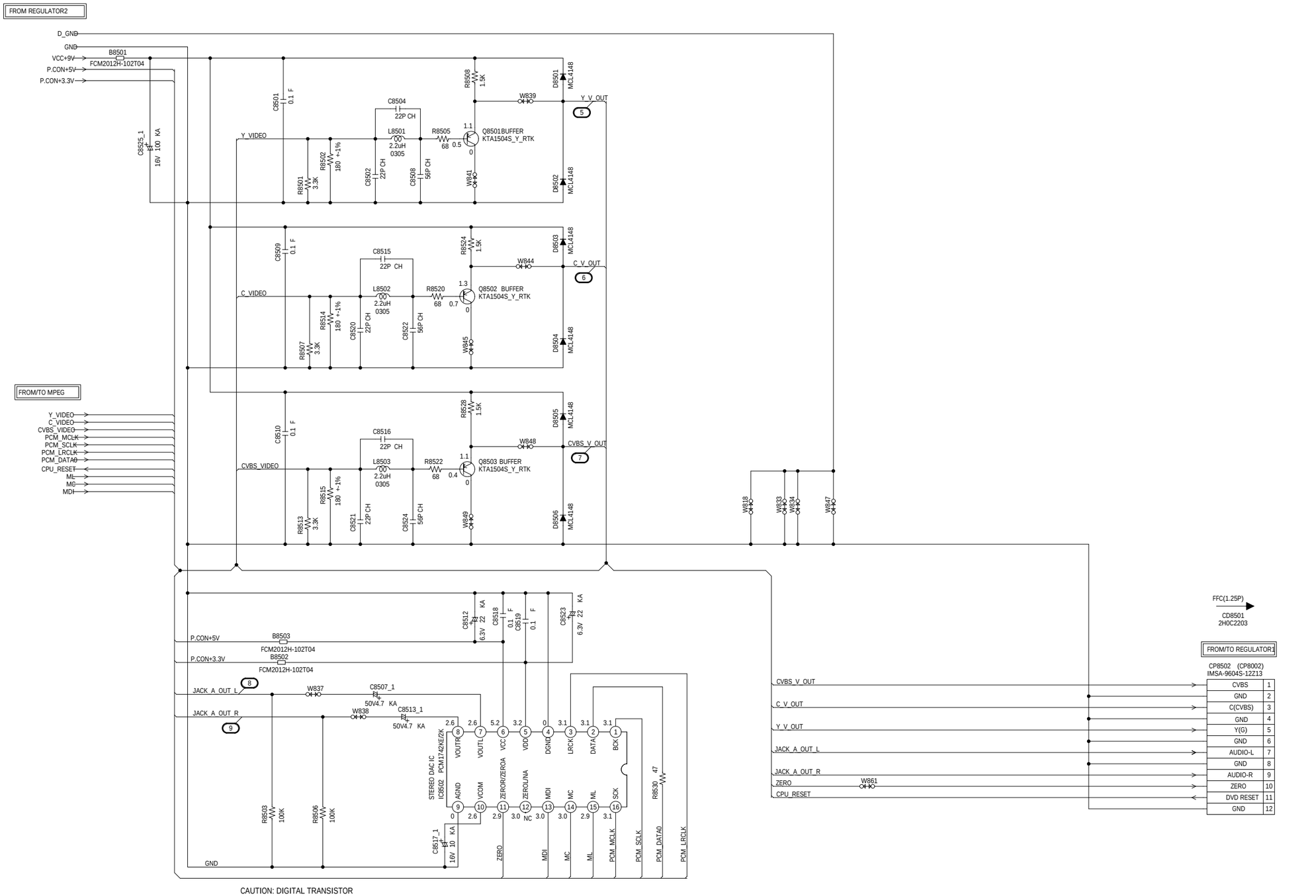
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB130
VMC297

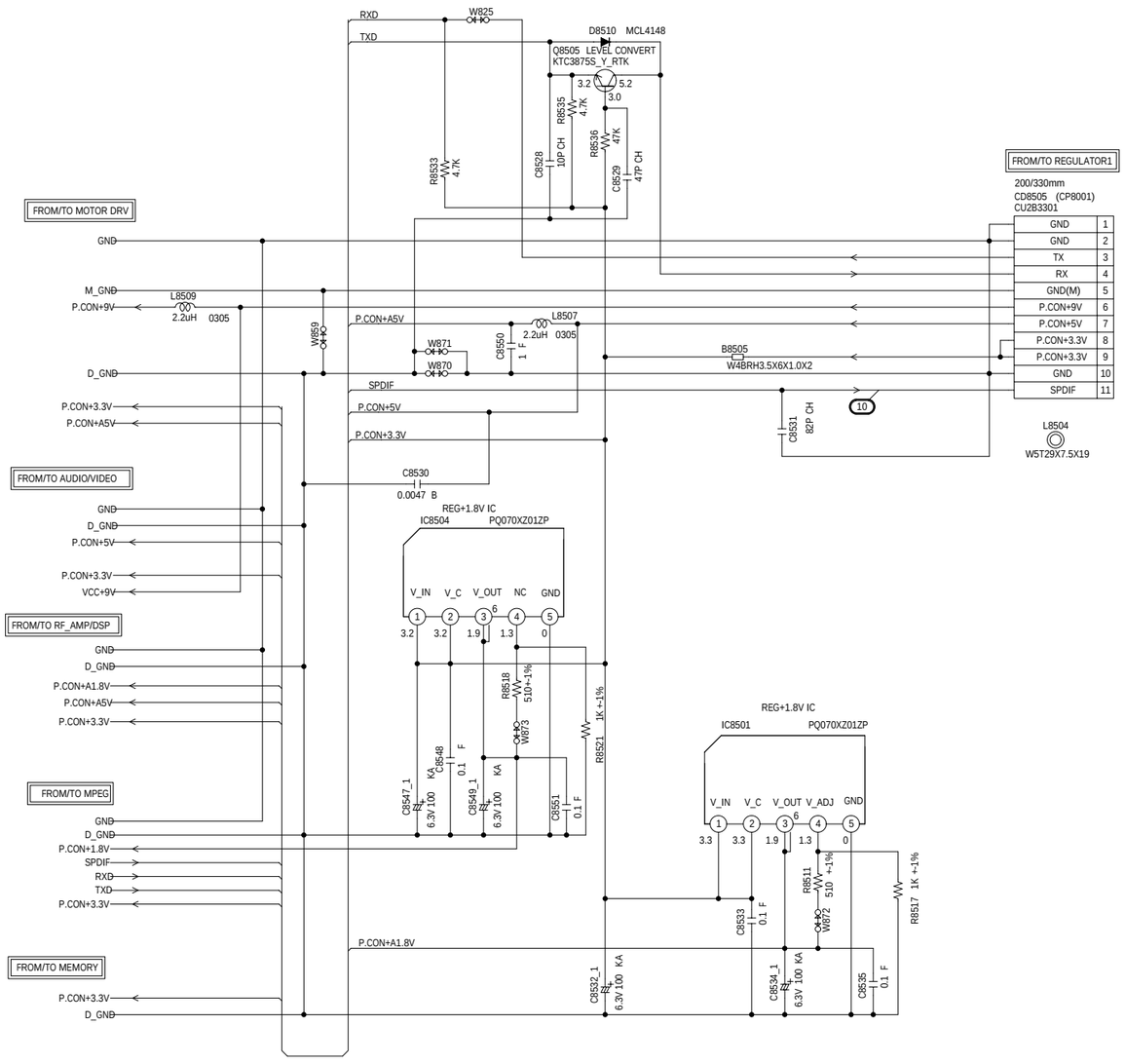
AUDIO/VIDEO SCHEMATIC DIAGRAM

(DVD PCB)



REGULATOR2 SCHEMATIC DIAGRAM

(DVD PCB)



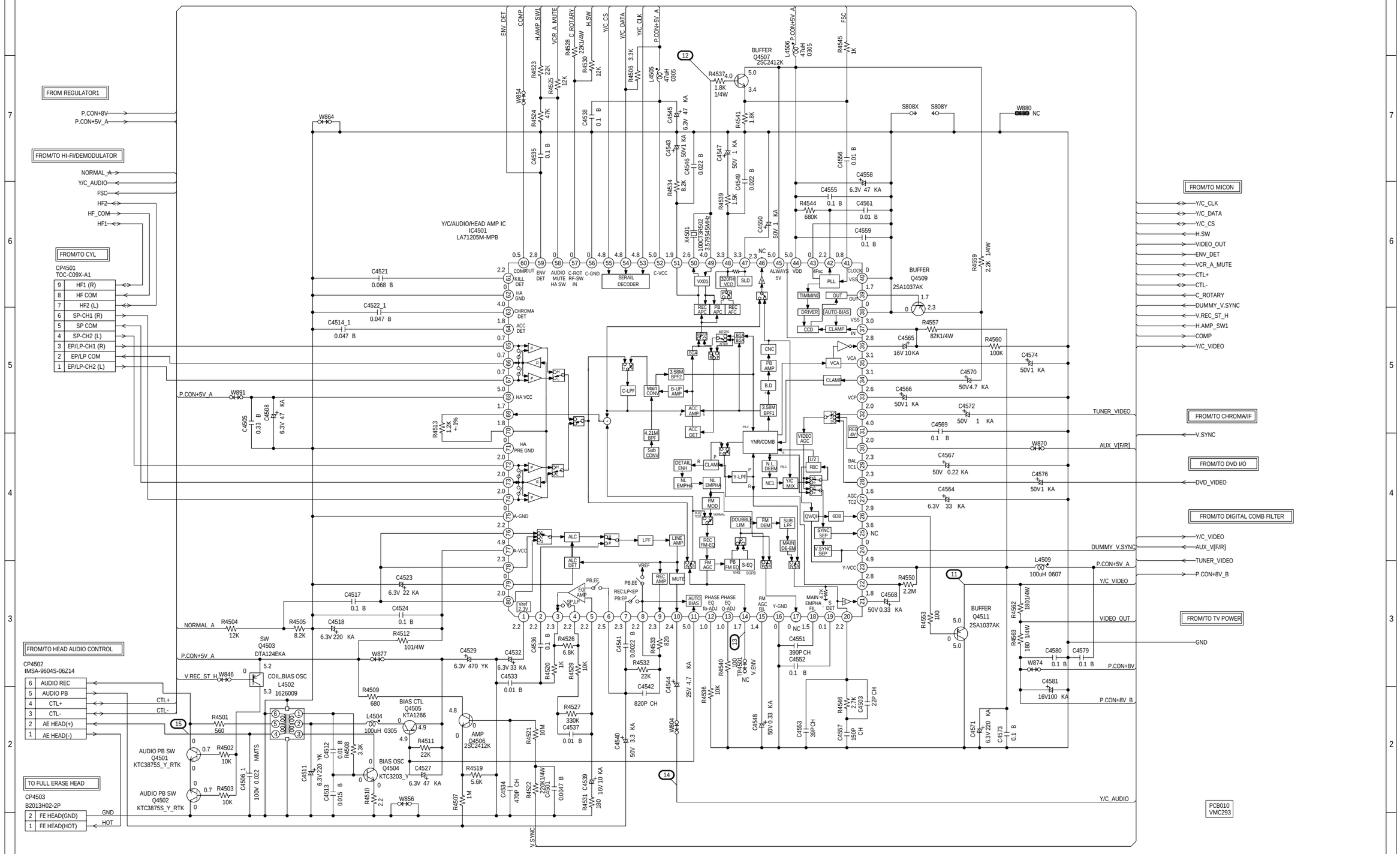
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB130
VMC297

Y/C/AUDIO/HEAD AMP SCHEMATIC DIAGRAM

(VCR PCB)

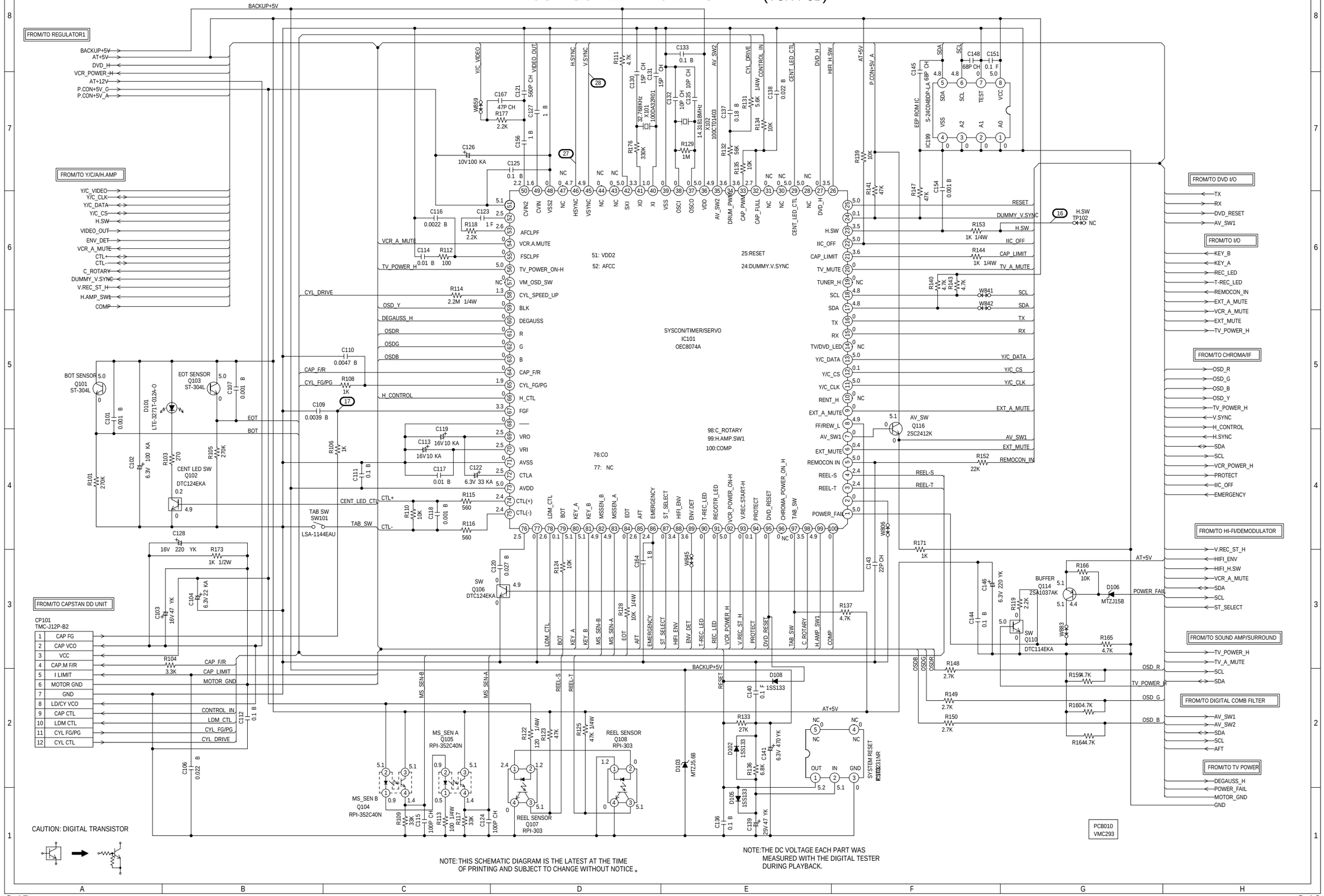


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

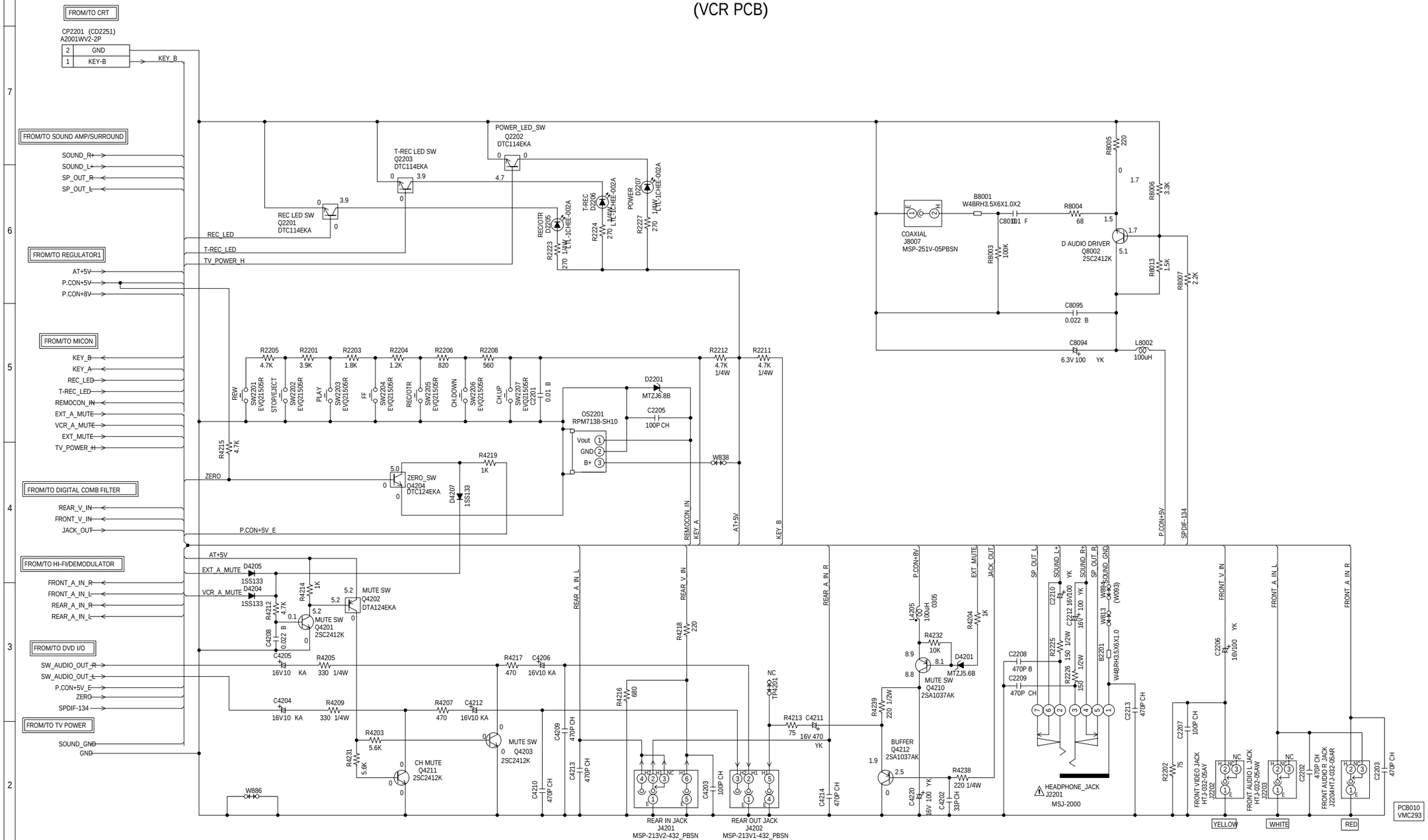
CAUTION: DIGITAL TRANSISTOR

MICON SCHEMATIC DIAGRAM (VCR PCB)



IN/OUT SCHEMATIC DIAGRAM

(VCR PCB)



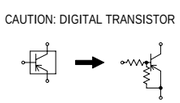
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

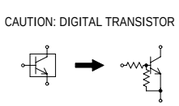
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CAUTION: DIGITAL TRANSISTOR



CAUTION: DIGITAL TRANSISTOR



CHROMA/IF SCHEMATIC DIAGRAM (VCR PCB)

FROM/TO REGULATOR
P.CON+5V
P.CON+8V
AT5.7VREG
8.5VREG
P.CON+5V_C

FROM/TO DIGITAL COMB FILTER
Y/C_VIDEO-Y
COMB_FSC
SW_C

FROM/TO DVD I/O
DVD_Y/C-Y

FROM/TO Y/C/A/H.AMP
V.SYNC

FROM/TO DEFLECTION
CP602 (CP602B)
B2013H02-9P
1 V.OUT
2 TV_POWER_H
3 AFC
4 ACL
5 NC
6 H.OUT
7 P.CON+5V
8 EMERGENCY
9 +B_DOWN
CD602
CU291701

CP601
A2001WR2-4P
1 GND
2 SCL
3 SDA
4 IIC_OFF

FROM/TO TV POWER
MOTOR+12V
MOTOR_GND
GND

FROM/TO MICON
PROTECT
EMERGENCY
V.SYNC
H.SYNC
VCR_POWER_H
IIC_OFF
OSD_Y
OSD_B
OSD_G
OSD_R
SDA
SCL
H_CONTROL
TV_POWER_H

CHROMA/IF_IC
IC601
LA76319M-MPB-E

10V_REG IC
IC602
KIA78L10F-RTF

FROM/TO CRT
CP603 (CP603B)
B2013H02-8P
CUT_OFF
GND
R.OUT
G.OUT
B.OUT
CLAMP_OFF
CD603
CU284501

CAUTION: DIGITAL TRANSISTOR
CAUTION: DIGITAL TRANSISTOR

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

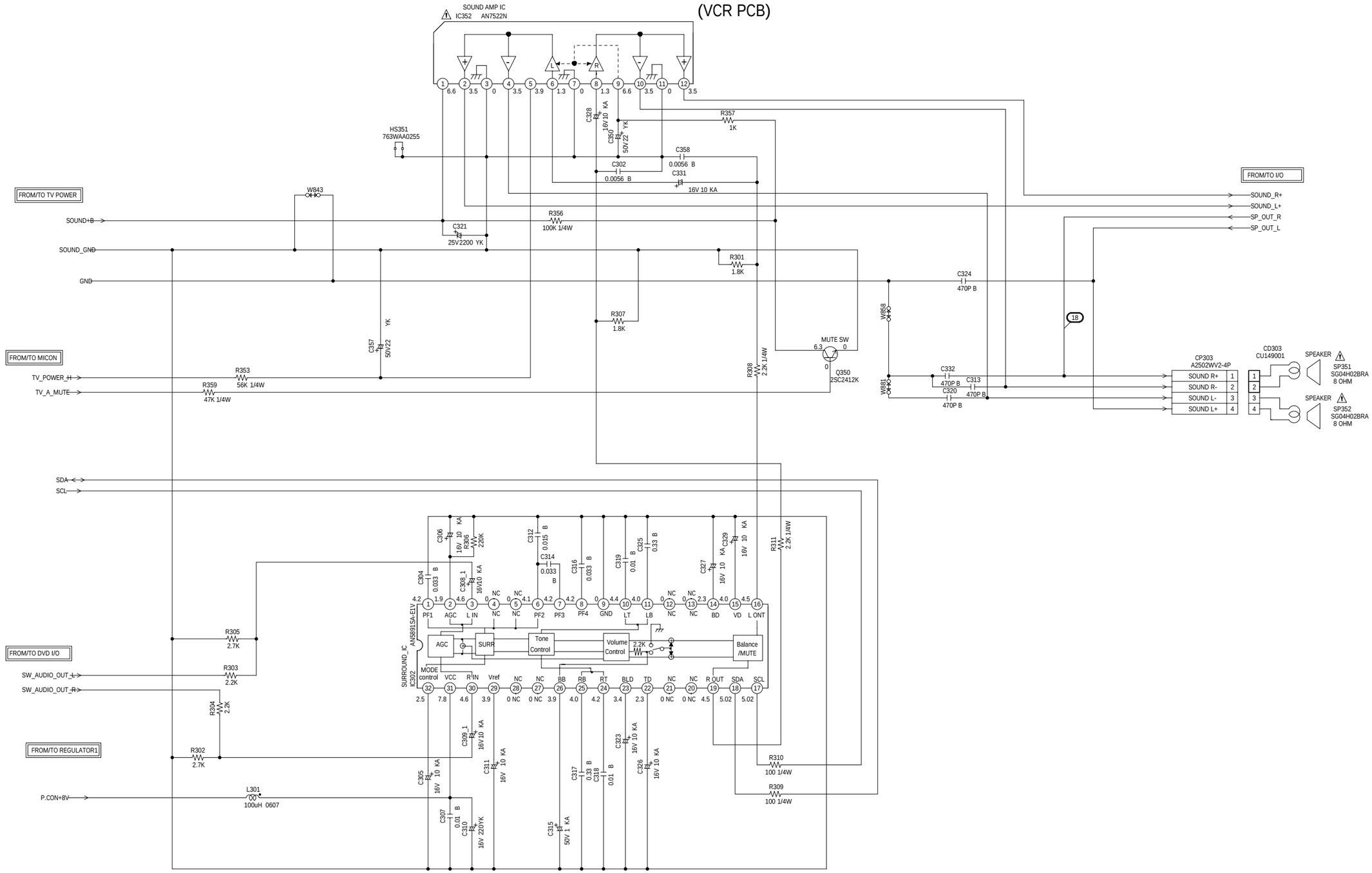
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

PCB010
VMC293

SOUND AMP/SURROUND SCHEMATIC DIAGRAM

(VCR PCB)



ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

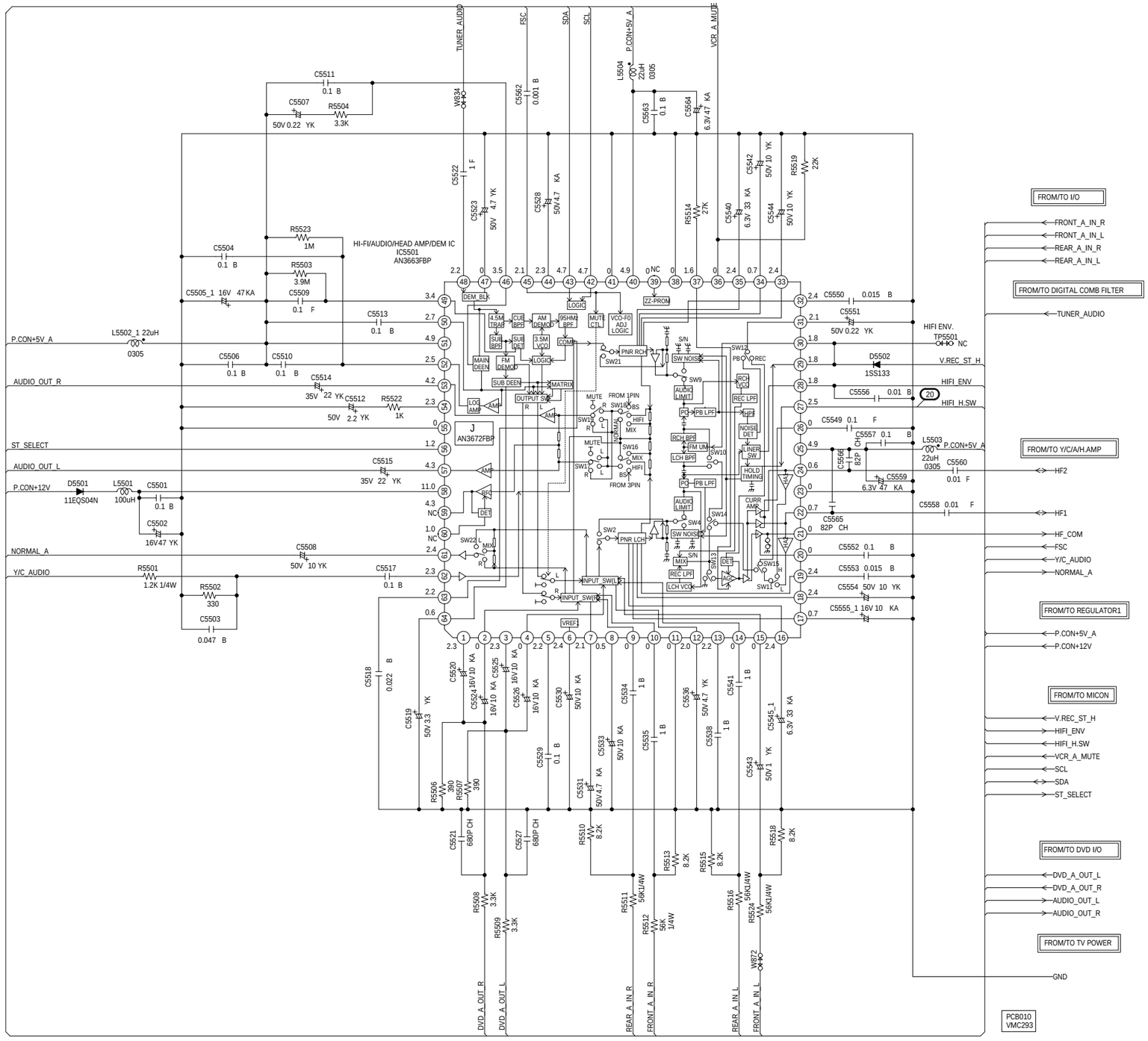
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

Hi-Fi/DEMODULATOR SCHEMATIC DIAGRAM

(VCR PCB)

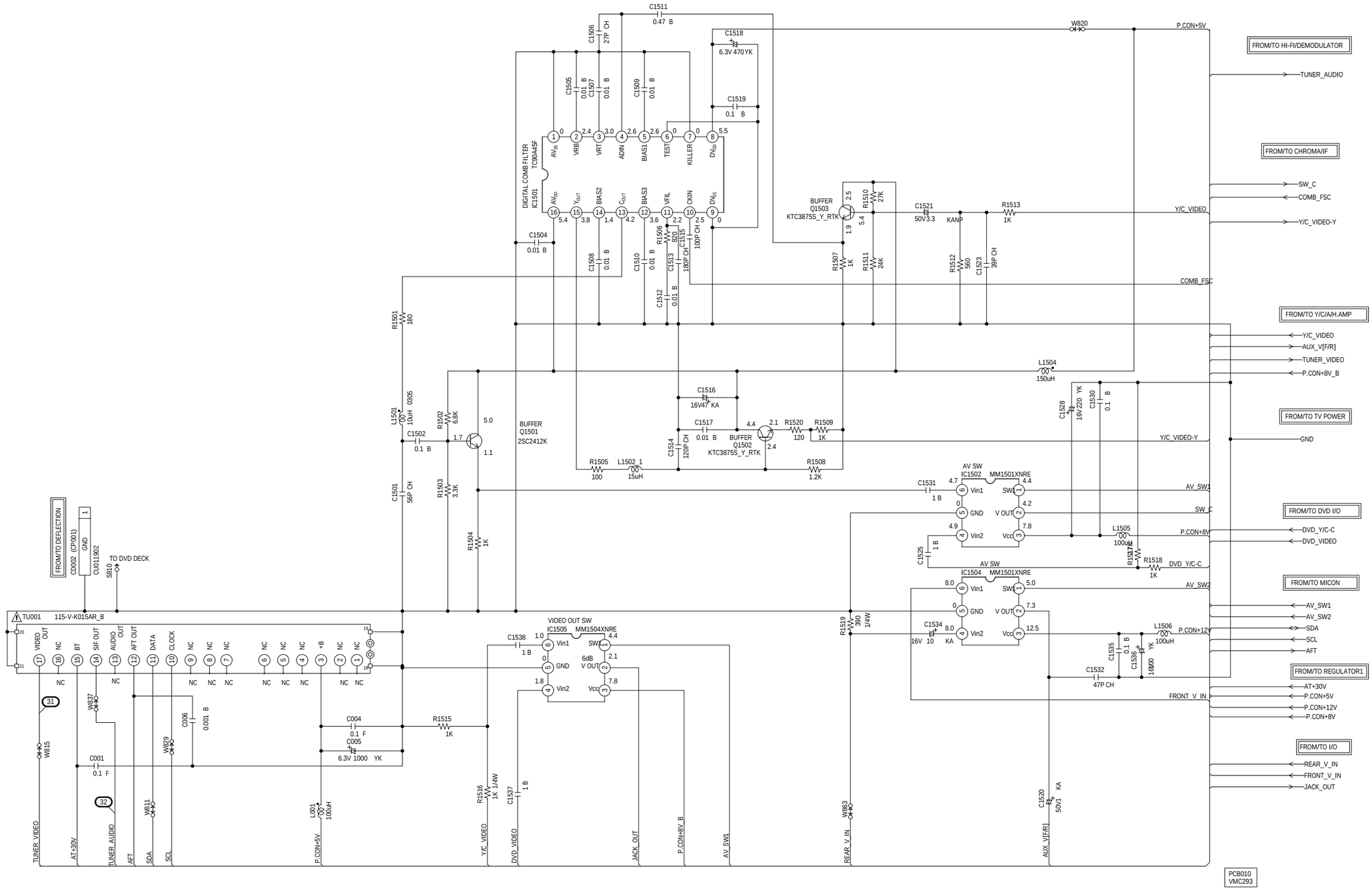


NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

DIGITAL COMB FILTER SCHEMATIC DIAGRAM

(VCR PCB)



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

DVD IN/OUT SCHEMATIC DIAGRAM

(VCR PCB)

FROM/TO REGULATOR2

CP8001 (CD8505)
A2001WV2-11P

1	GND
2	GND
3	TX
4	RX
5	GND
6	P.CON+9V
7	P.CON+D5V
8	P.CON+3.3V
9	P.CON+3.3V
10	GND
11	SPDIF-134

W844 TX
W816 RX
C8019 56P CH
C8017 0.01 B
P.CON+9V_DH
P.CON+5V_D
P.CON+3.3V
SPDIF-134
S801X S801Y
R8001 4.7K

FROM/TO AUDIO/VIDEO

CP8002 (CP8502)
IMSA-9604S-12Z14

12	CVBS
11	GND
10	C(CVBS)
9	GND
8	Y
7	GND
6	AUDIO-L
5	GND
4	AUDIO-R
3	ZERO
2	DVD RESET
1	GND

W887 DVD_VIDEO
DVD_Y/C-C
DVD_Y/C-Y
ZERO
DVD_RESET
C8020 100P CH
C8044 0.1 B

ZERO MUTE SW Q8007 DTC124EKA
ZERO MUTE SW Q8006 2SC2412K
R8012 4.7K 1/4W

P.CON+12V
R8022 10 1/4W
C8090 0.1 F
C8002 16V 220 YK
C8005 50V2.2 KA
C8070 820P CH
C8081 100P CH
R8051 12K
R8054 8.2K
R8056 3.9K
R8023 10K
R8049 10K
C8004 16V22 KA
W851
29
R8020 4.7K
C8023 50V2.2 NA
R8024 100K1/4W
R8027 1K
R8021 4.7K
C8022 50V2.2 NA
R8025 100K1/4W
C8064 820P CH
R8047 1K
C8065 10V 33 KA
R8026 10K
R8048 10K
C8025 820P CH
C8079 100P CH
R8050 12K
R8052 8.2K
R8053 3.9K
C8102 50V 2.2 KA
C8077 820P CH
C8003 16V22 KA
W850
30

A_GND
IC8004 NJM4580M
MIXER
VCC

AV_SW1
AUDIO_OUT_L
C8001 16V10 KA
AUDIO SW IC8001 MM1501XNRE
Vin1 SW1 Vin2 GND V OUT Vcc
L8001 100uH 0305
C8012 0.1 B
C8013 16V100 YK
C8006 16V10 KA
C8009 16V10 KA
AUDIO_OUT_R
AUDIO SW IC8002 MM1501XNRE
L8003 100uH 0305
C8007 16V10 KA
C8014 0.1 B
C8015 16V100 KA
R8012 4.7K 1/4W
AT+5V
P.CON+5V_E
DVD_A_OUT_L
DVD_A_OUT_R

FROM/TO SOUND AMP/SURROUND
SW_AUDIO_OUT_L
SW_AUDIO_OUT_R

FROM/TO I/O
SW_AUDIO_OUT_L
SW_AUDIO_OUT_R
ZERO
SPDIF-134
P.CON+5V_E

FROM/TO DIGITAL COMB FILTER
DVD_Y/C-C
DVD_VIDEO

FROM/TO CHROMA/IF
DVD_Y/C-Y

FROM/TO MICON
TX
RX
DVD_RESET
AV_SW1

FROM/TO TV POWER
GND

FROM/TO REGULATOR1
P.CON+3.3V
P.CON+5V_D
P.CON+12V
P.CON+9V_DH
AT+5V

FROM/TO Y/C/A/H.AMP
DVD_VIDEO

FROM/TO HI-FI/DEMODULATOR
DVD_A_OUT_L
DVD_A_OUT_R
AUDIO_OUT_L
AUDIO_OUT_R

PCB010
VMC293

CAUTION: DIGITAL TRANSISTOR

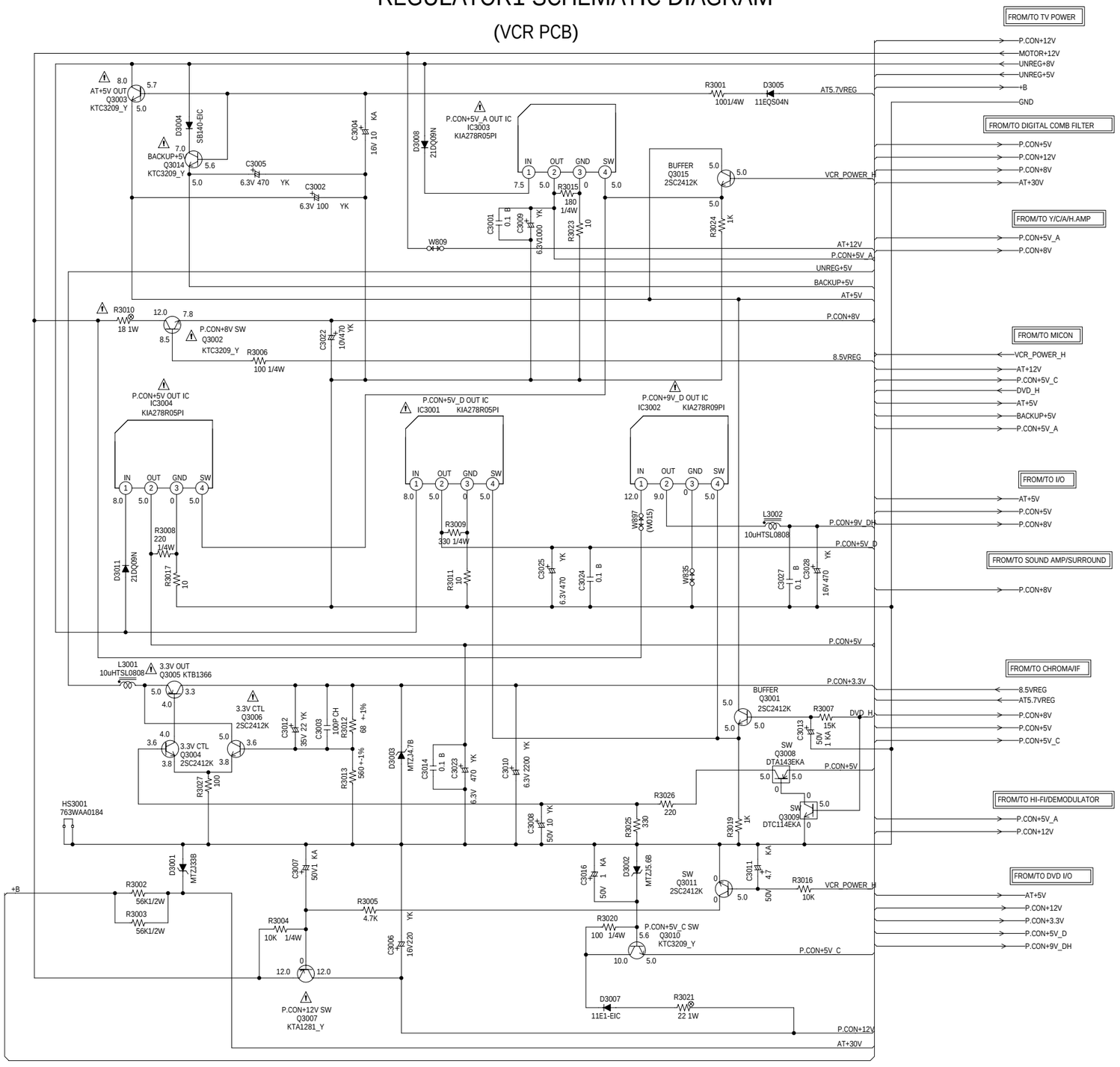
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP
IS NON POLAR ONE.

NOTE: THE DC VOLTAGE EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

REGULATOR1 SCHEMATIC DIAGRAM

(VCR PCB)



PCB010
VMC293

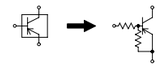
NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

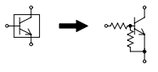
ATTENTION:LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION:SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

CAUTION: DIGITAL TRANSISTOR

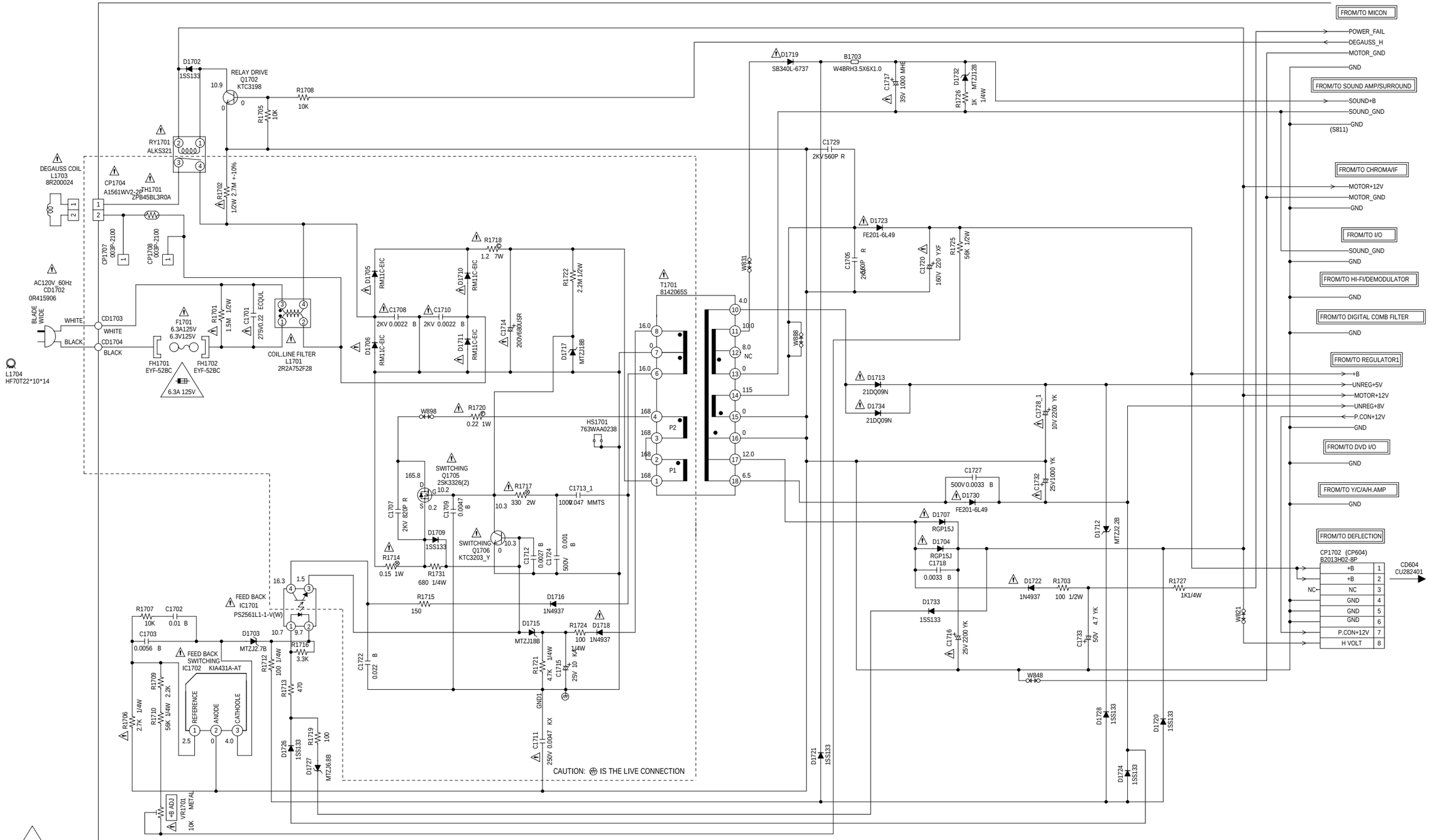


CAUTION: DIGITAL TRANSISTOR



TV POWER SCHEMATIC DIAGRAM

(VCR PCB)



CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 6.3A 125V (F1701)

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTOLISER QUE DES FUSIBLE DE MEME TYPE 6.3A 125V (F1701)

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

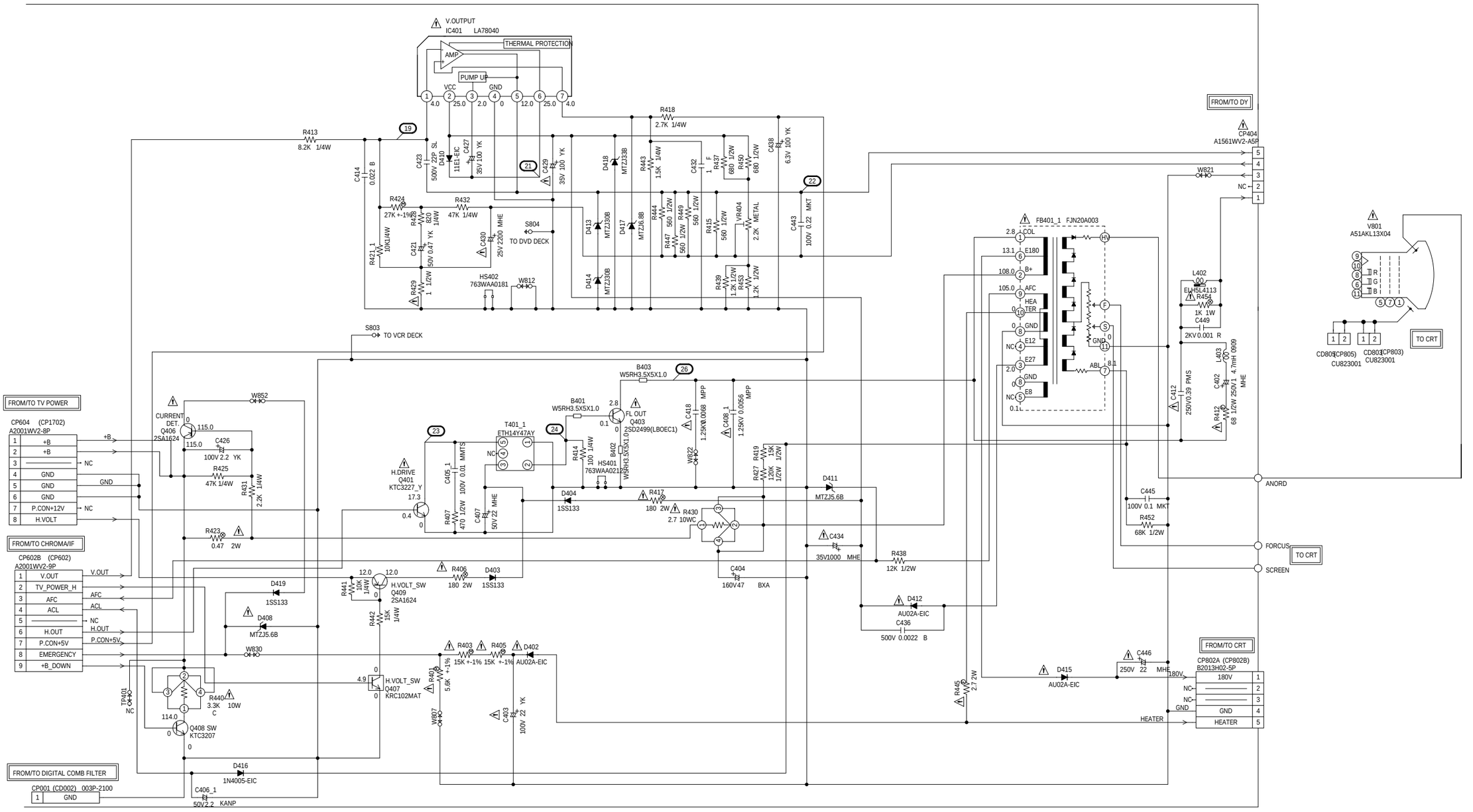
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

DEFLECTION SCHEMATIC DIAGRAM

(DEFLECTION PCB)



PCB080
TMC564

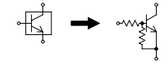
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION :LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

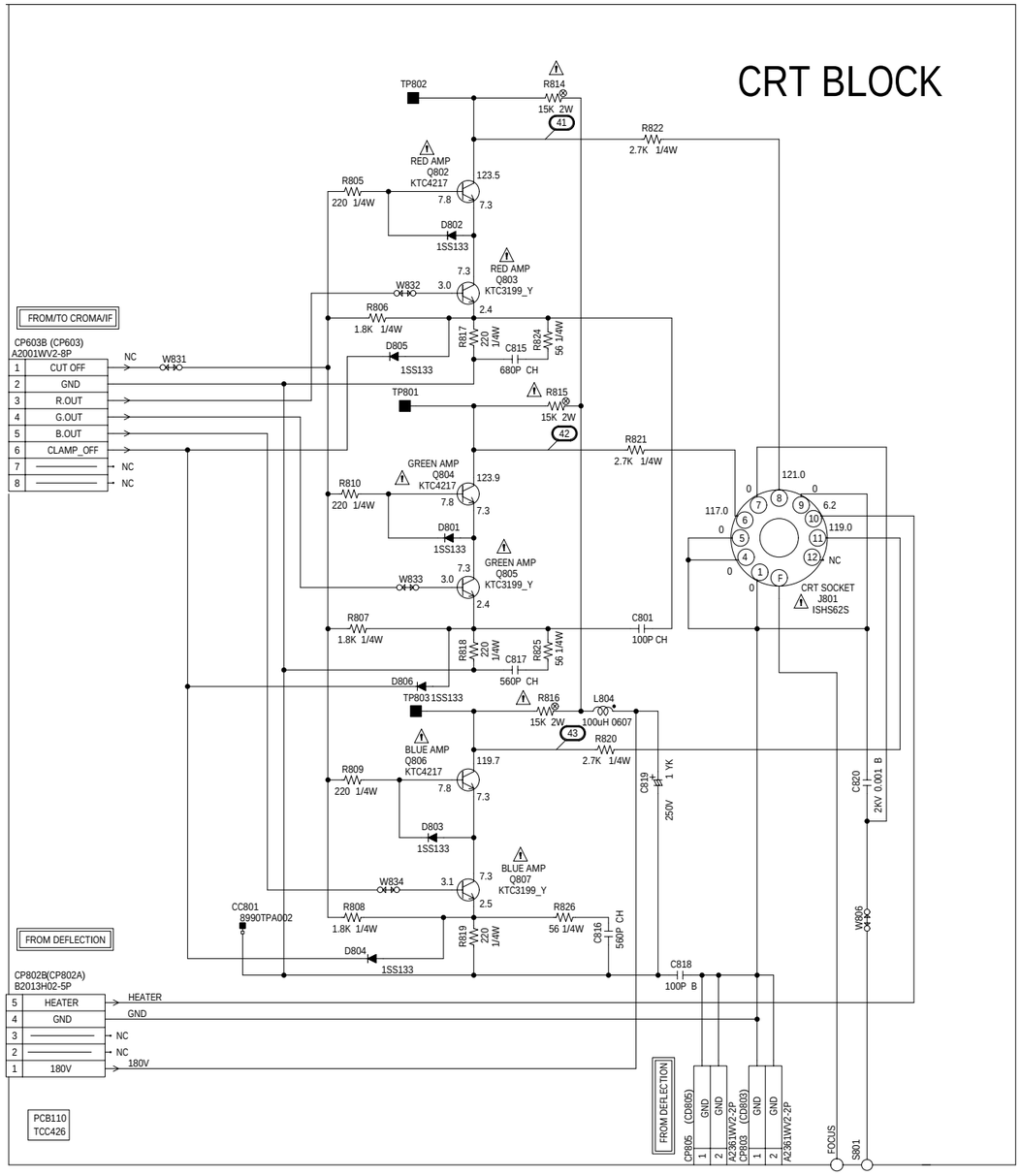
CAUTION: DIGITAL TRANSISTOR



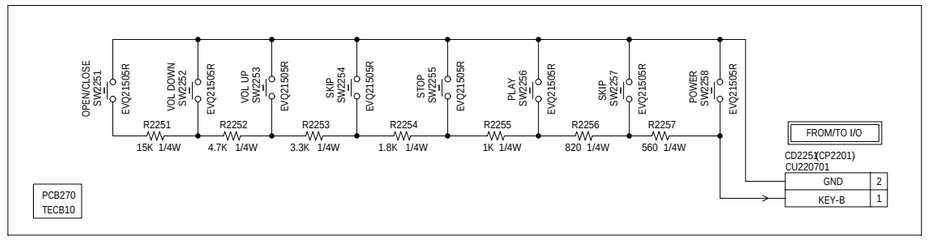
CRT/OPERATION SCHEMATIC DIAGRAM

(CRT PCB)

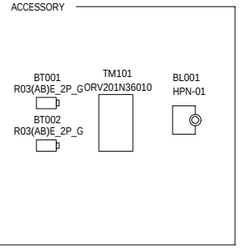
CRT BLOCK



(OPERATION PCB)



ACCESSORY



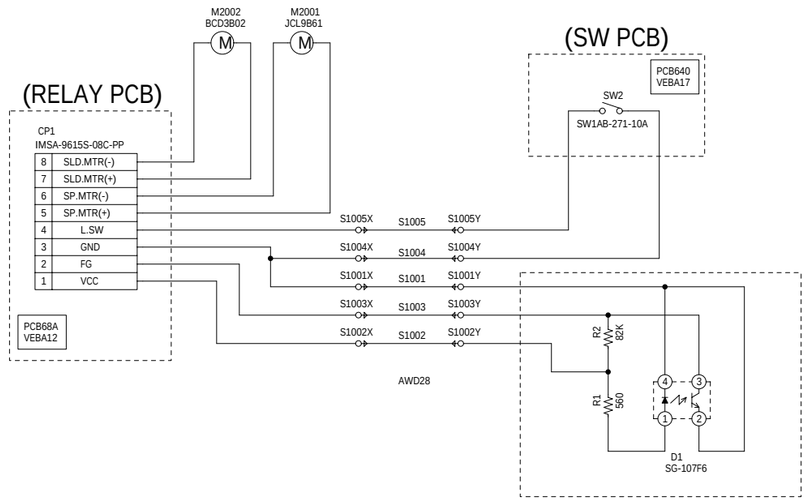
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

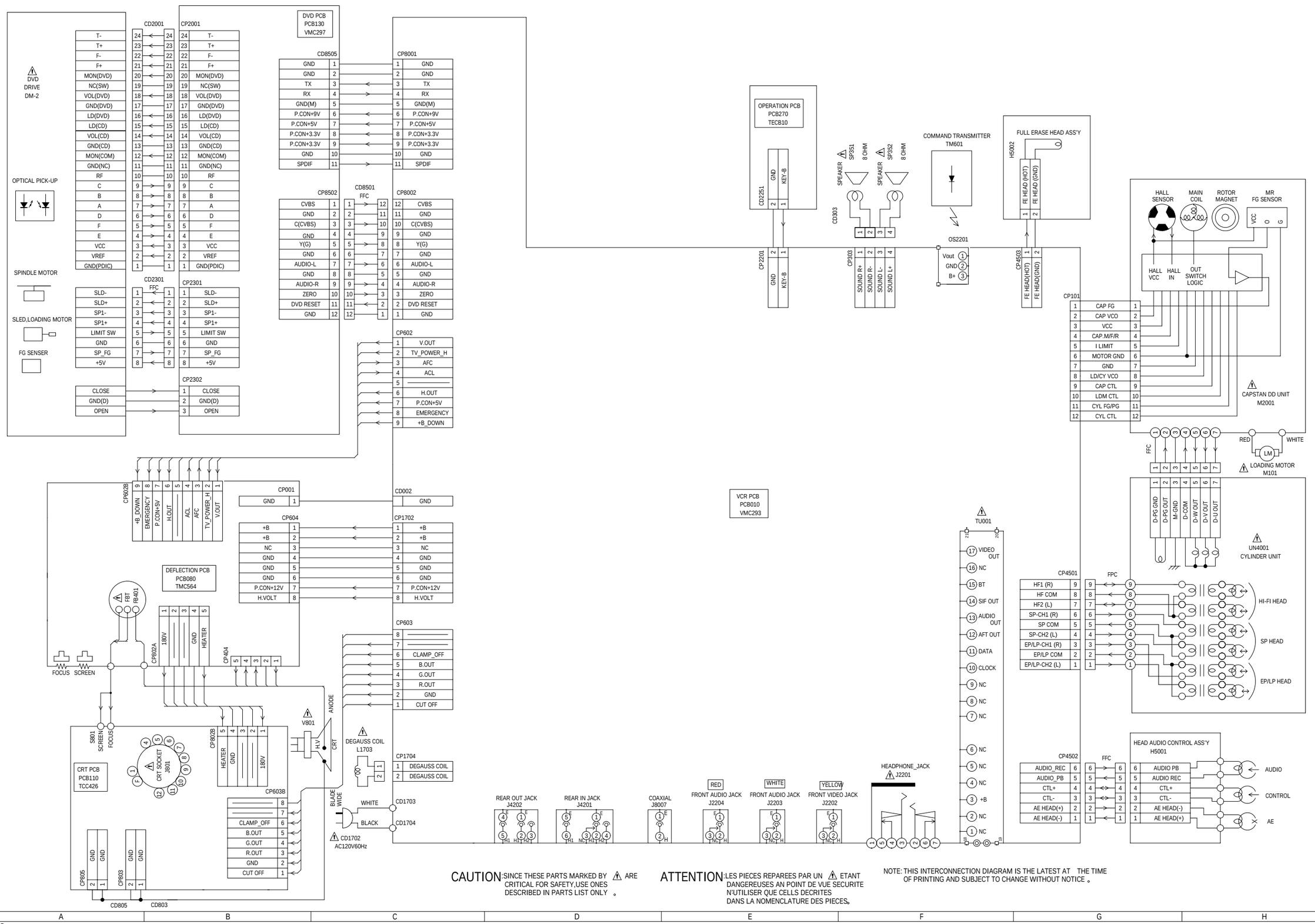
RELAY/SW/FG SCHEMATIC DIAGRAM



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

INTERCONNECTION DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

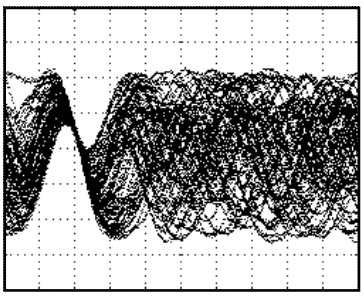
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

WAVEFORMS

RF_AMP/DSP

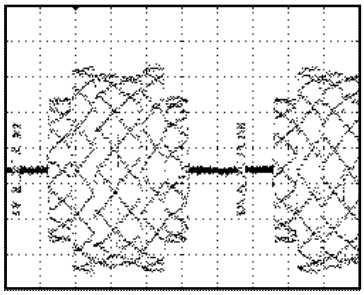
100ns
100mV

①



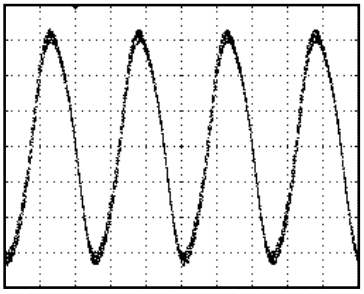
10µs
100mV

⑥



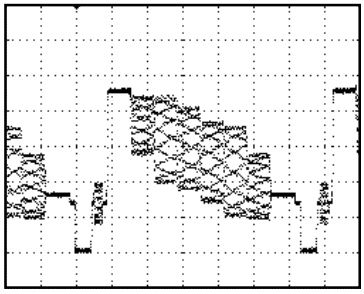
20ns
200mV

②



10µs
200mV

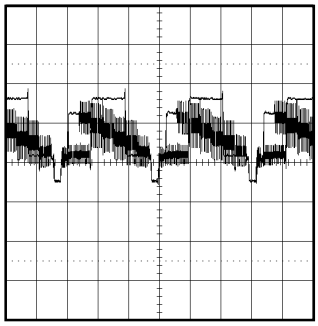
⑦



Y/C/AUDIO/HEAD AMP

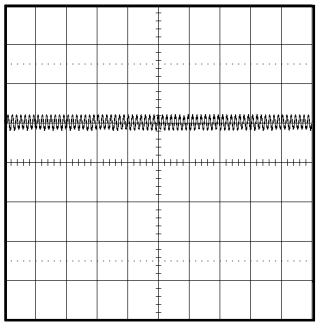
20µs
1.0V
REC/PB

⑪



2µs
1.0V
REC/PB

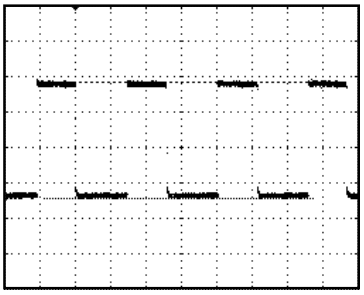
⑫



MOTOTR DRIVE

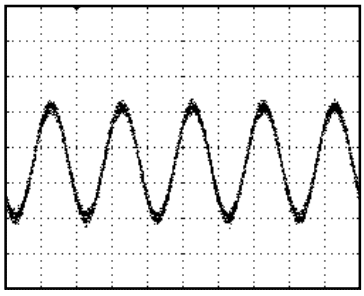
2ms
1.0V

③



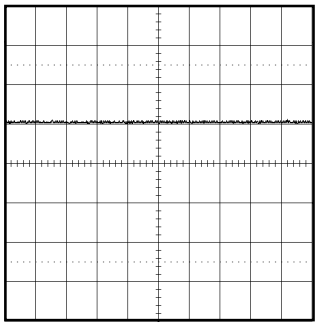
500µs
500mV

⑧



1ms
1.0V
PB

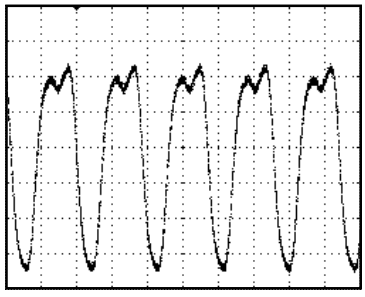
⑬



MPEG

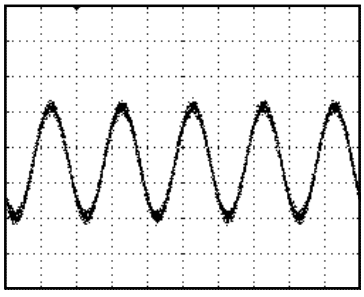
20ns
500mV

④



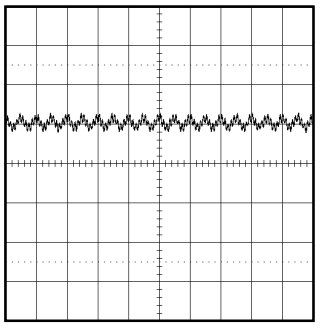
500µs
500mV

⑨



5ms
2.0V
REC/PB

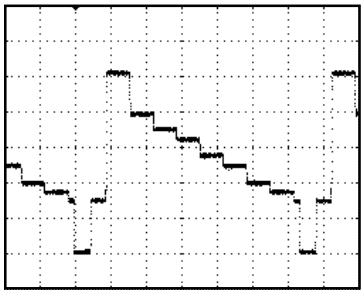
⑭



AUDIO/VIDEO

10µs
200mV

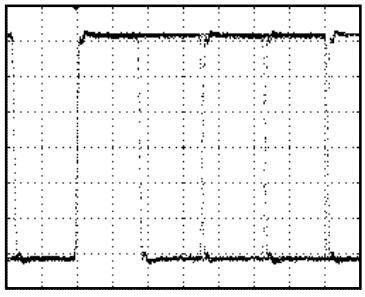
⑤



REGULATOR 2

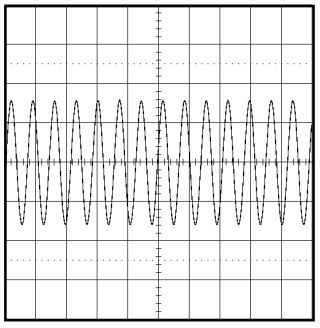
100ns
500mV

⑩



20µs
20V
REC

⑮



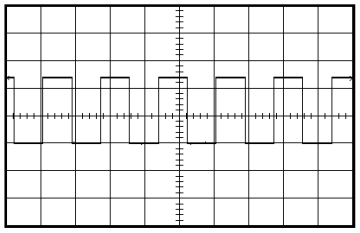
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

MICON

20ms
2.0V
PB

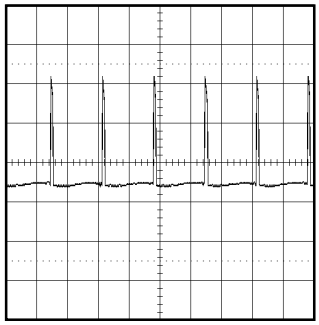
⑯



DEFLECTION

10ms
10V
POWER ON

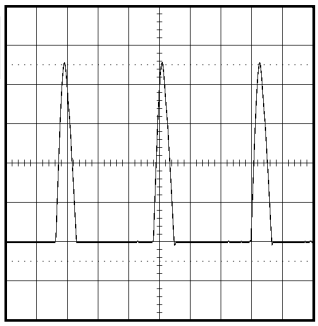
㉑



DEFLECTION

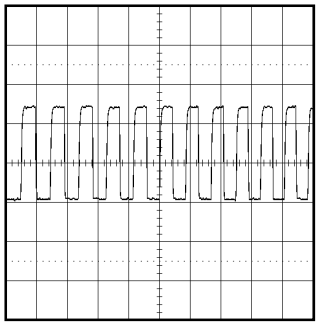
20µs
200V
POWER ON

㉖



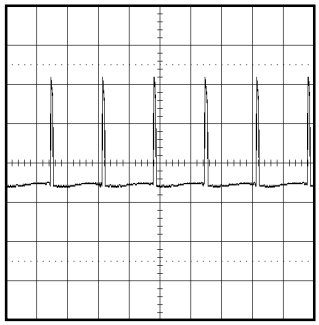
1ms
2.0V
PB

⑰



10ms
10V
POWER ON

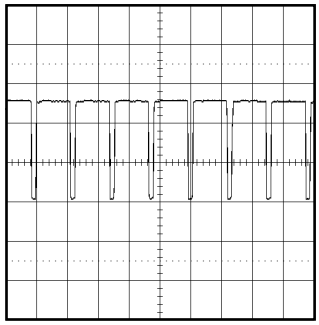
㉒



MICON

50µs
2.0V
POWER ON

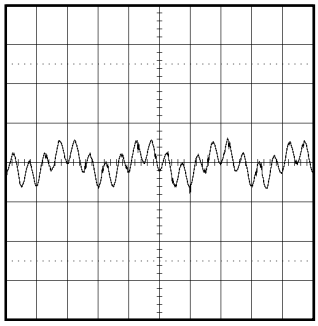
㉗



SOUND AMP/ SURROUND

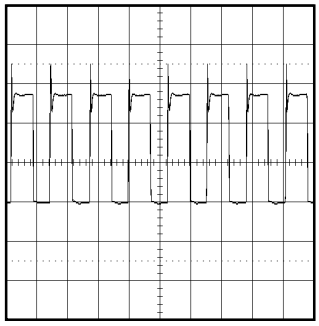
1ms
200mV
POWER ON

⑱



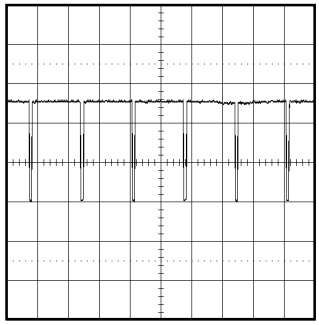
50µs
10V
POWER ON

㉓



10ms
2.0V
POWER ON

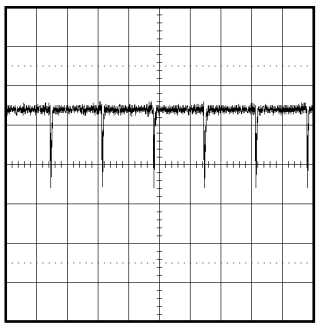
㉘



DEFLECTION

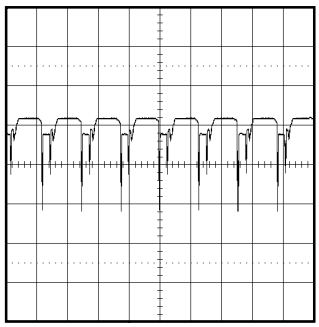
10ms
0.5V
POWER ON

⑲



50µs
5.0V
POWER ON

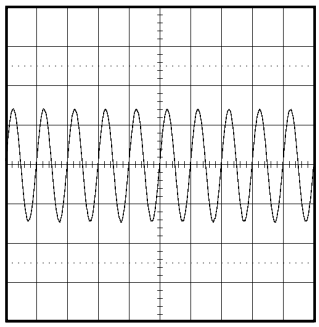
㉔



DVD IN/OUT

1ms
2.0V
DVD PLAY

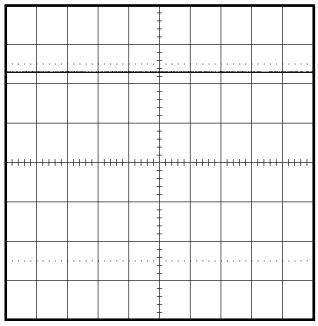
㉙



Hi-Fi/DEMODULATOR

1ms
1.0V
PB

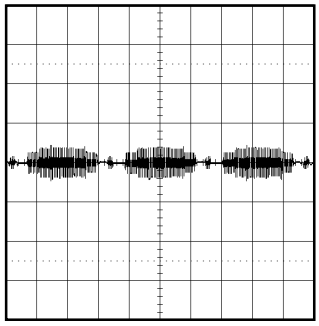
⑳



CHROMA/IF

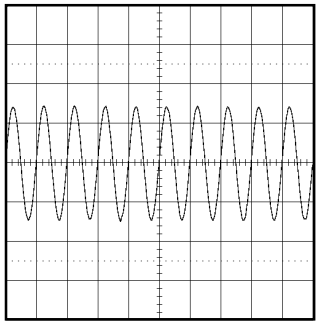
20µs
0.5V
POWER ON

㉕



1ms
2.0V
DVD PLAY

㉚



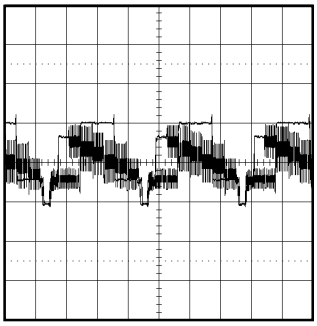
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

DIGITAL COMB FILTER

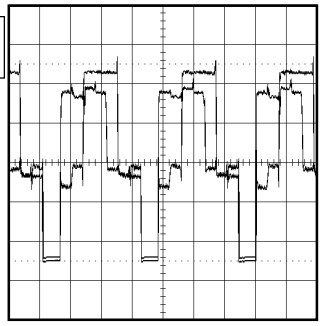
20µs
0.5V
POWER ON

31



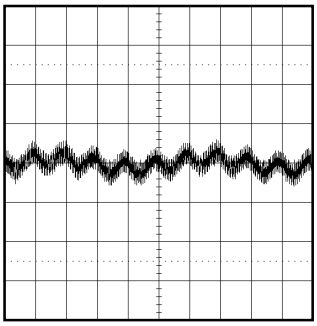
20µs
1.0V
POWER ON

36



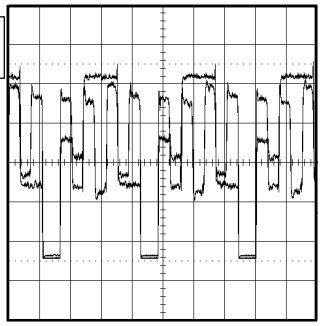
0.5ms
0.5V
POWER ON

32



20µs
1.0V
POWER ON

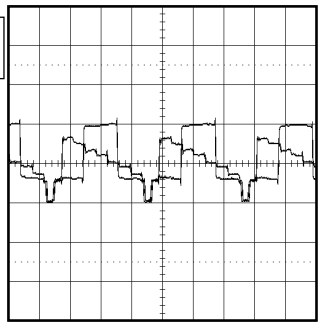
37



CHROMA/IF

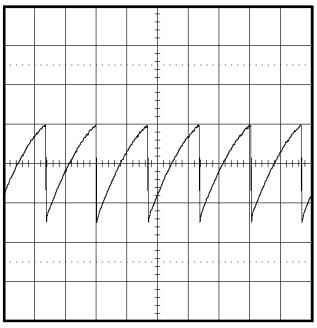
20µs
0.5V
POWER ON

33



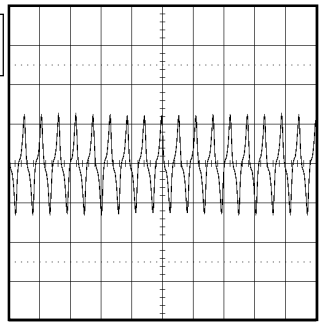
10ms
1.0V
POWER ON

38



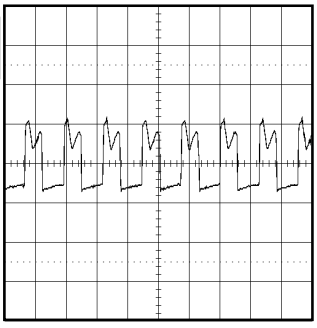
0.5µs
100mV
POWER ON

34



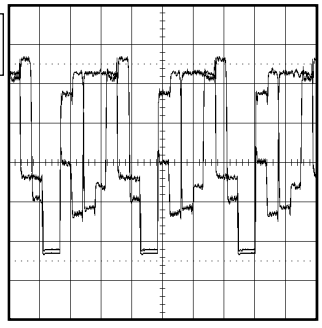
50µs
0.5V
POWER ON

39



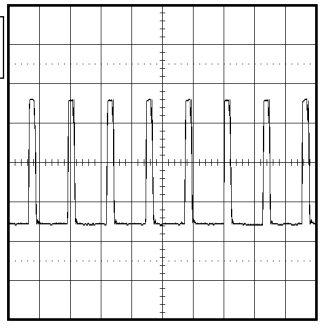
20µs
1.0V
POWER ON

35



50µs
2.0V
POWER ON

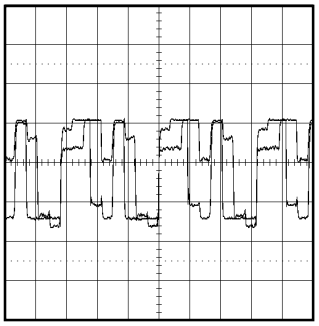
40



CRT

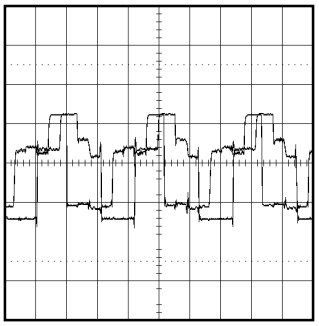
20µs
50V
POWER ON

41



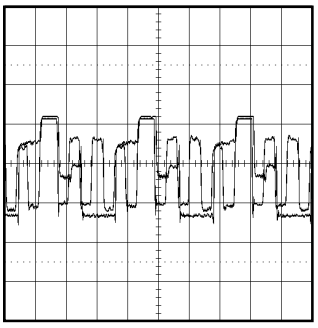
20µs
50V
POWER ON

42



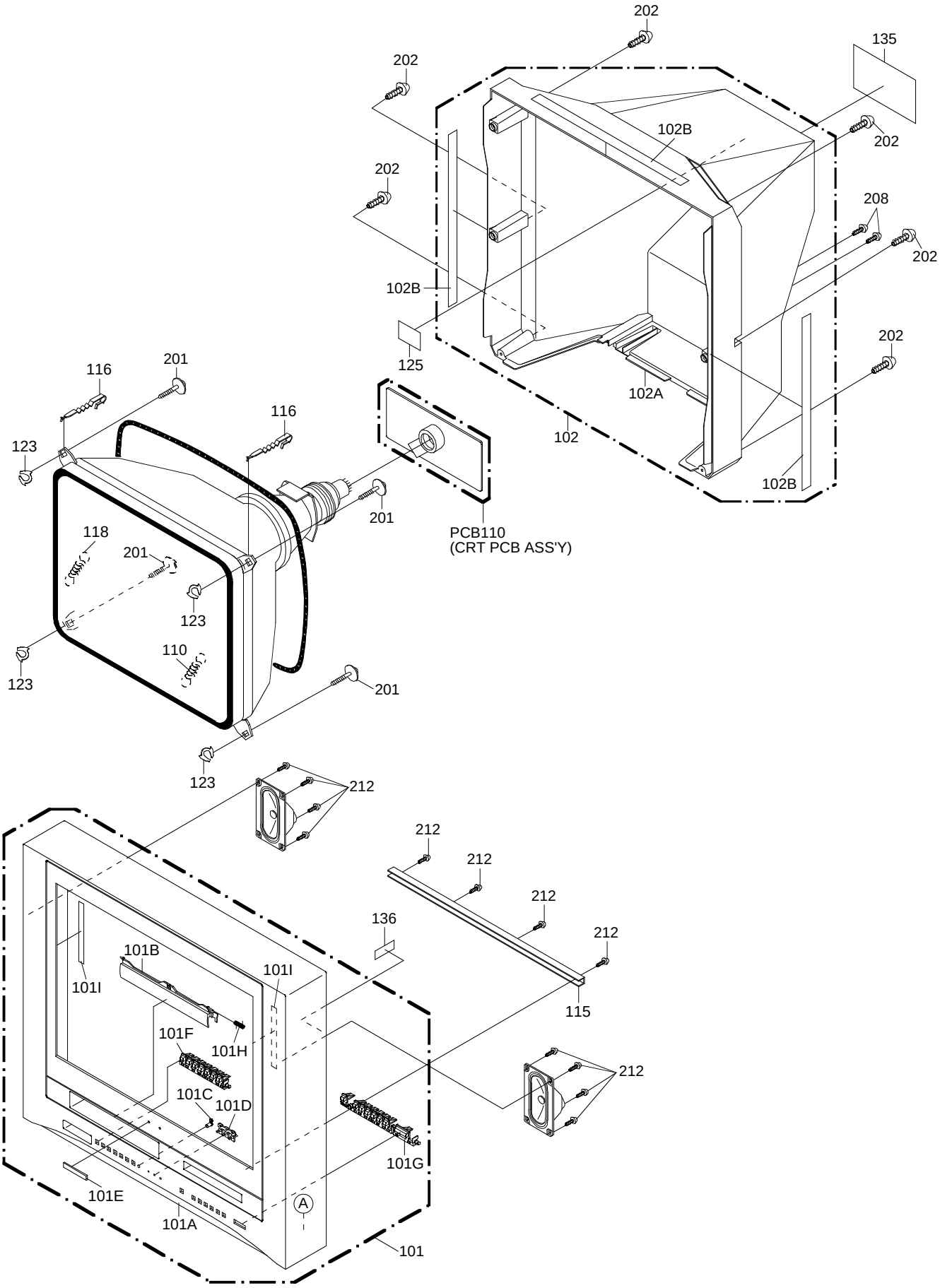
20µs
50V
POWER ON

43

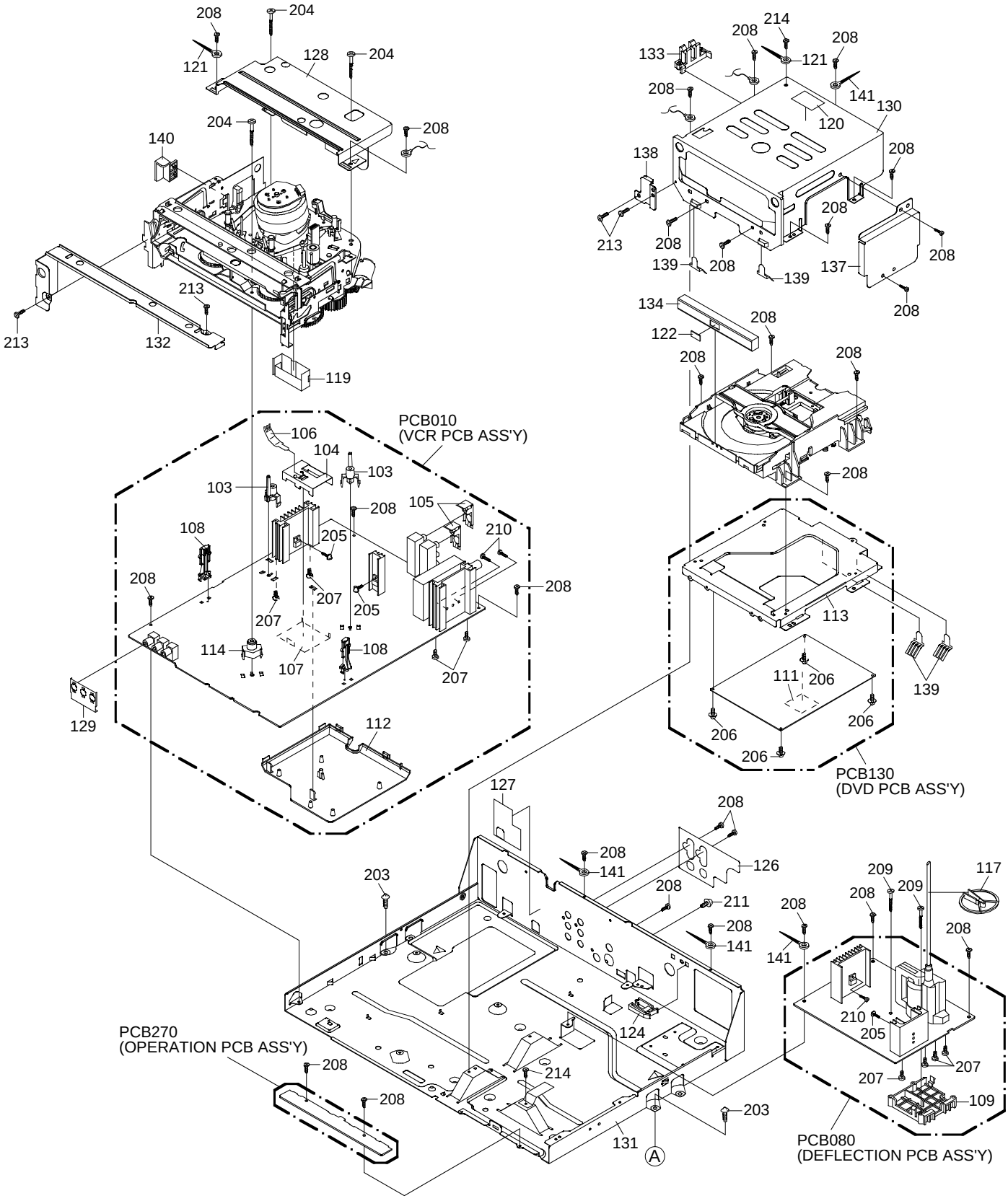


NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

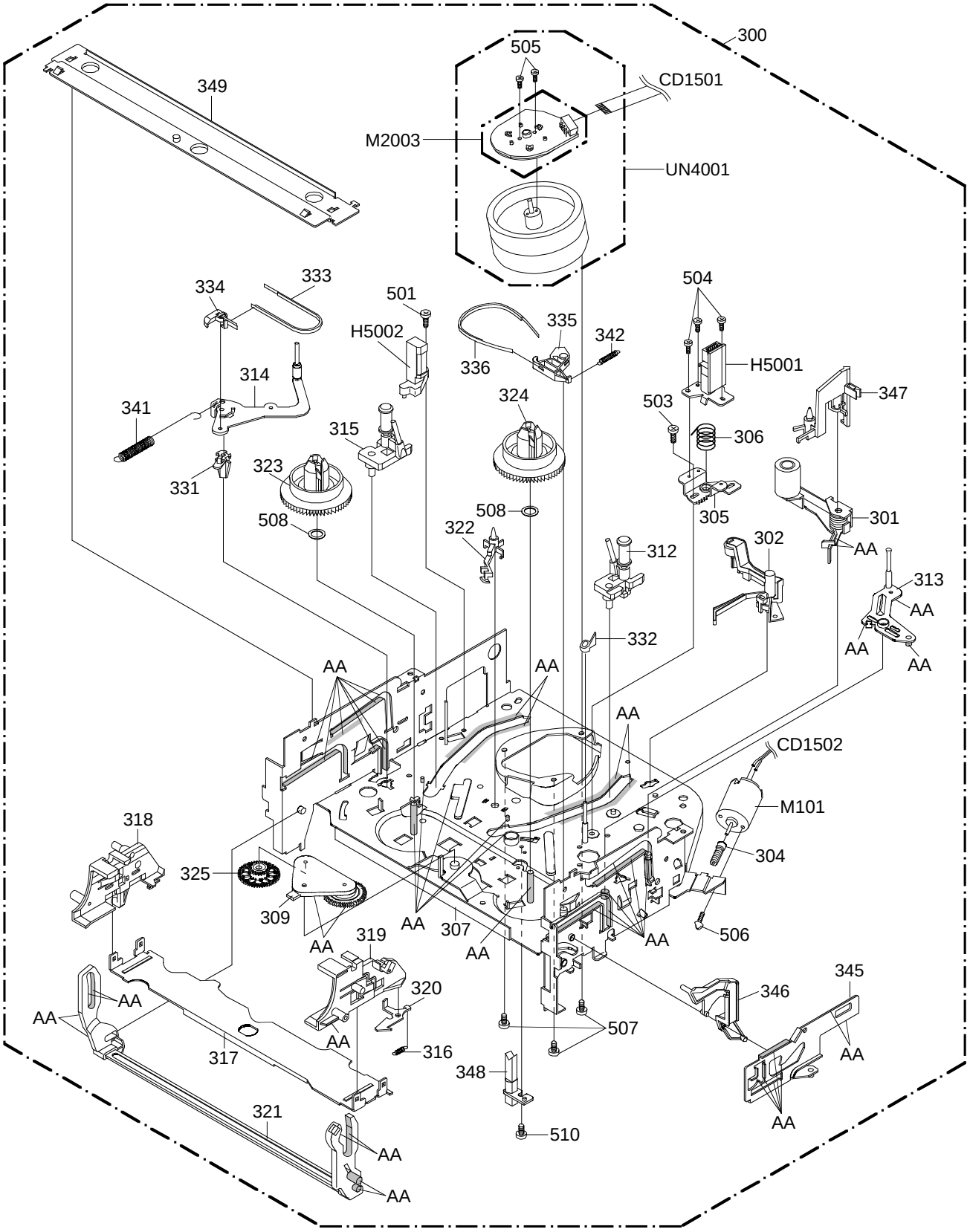
MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW



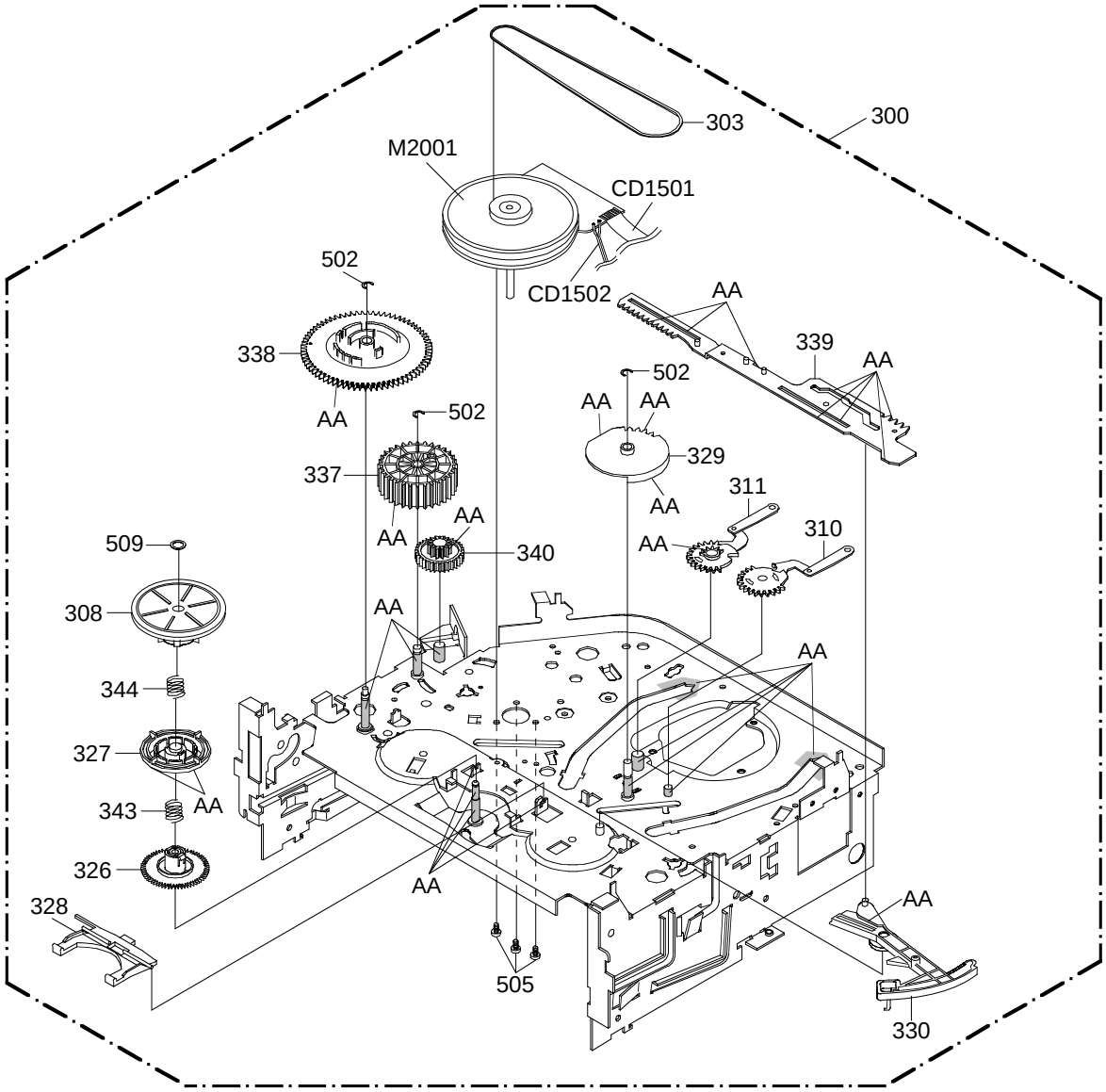
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

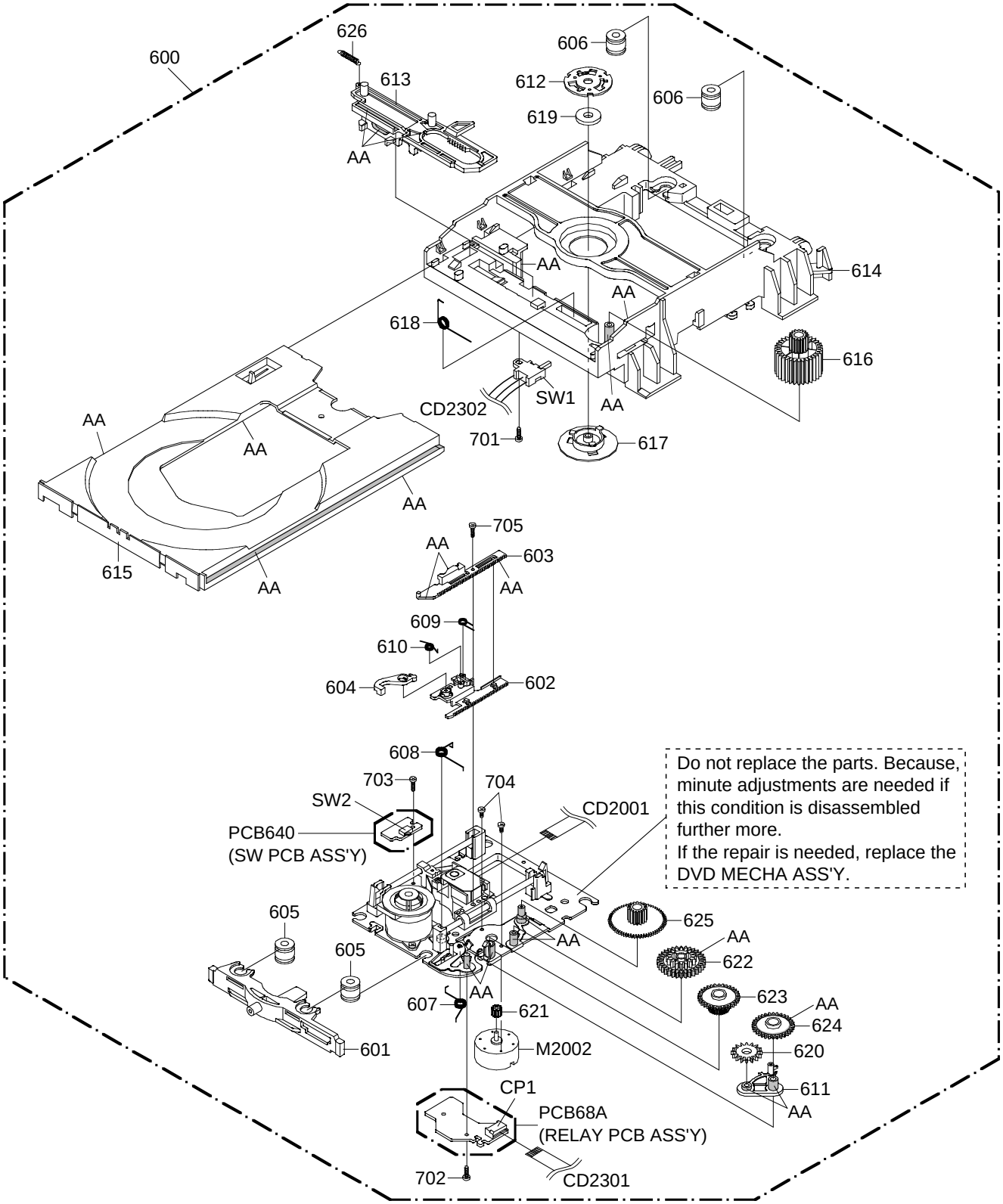
CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

DVD DECK EXPLODED VIEW



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE000697	A5I502A720	CABINET,FRONT ASSY	
101A	AE000149	701WPJ1213	CABINET,FRONT	
101B	AE000150	712WPJ0827	FLAP	
101C	BZ710665	713WPA0160	GUIDE,REMOCON	
101D	BZ710666	713WPA0195	GLASS,LED	
101E	AE000155	7235490021	BADGE,BRAND	
101F	BZ710667	735WPB0216	BUTTON,FRAME1	
101G	BZ710668	735WPB0217	BUTTON,FRAME2	
101H	BZ710010	743WKA0032	SPRING,FLAP	
101I	AE000003	800WQ00045	FELT SHEET	
102	AE000698	A5I502A740	CABINET,BACK ASSY	
102A	AE000224	702WPA1000	CABINET,BACK	
102B	AE000166	800WQ00041	FELT SHEET	
103	BZ710658	701WPA0751	HOLDER,DECK	
104	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP	
105	BZ710659	752WSA0290	SHIELD,COMPO	
106	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP	
107	AD301956	752WSA0308	SHIELD,COVER HEAD AMP	
108	BZ710498	85OP700038	HOLDER,END SENSOR	
109	BZ710459	761WPA0223	HOLDER,FBT	
110	AD300759	741WUA0021	SPRING,EARTH	
111	AD302398	7232020746	SHEET,IC	
112	AD301957	755WPA0035	COVER,PCB	
113	AD301958	761WSA0099	ANGLE,DECK	
114	BZ710577	701WPA0686	HOLDER,DECK	
115	BZ710677	752WSA0287	ANGLE,FRONT	
116	BZ710259	762WPA0011	HOLDER,CRT WIRE	
117	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
118	BZ710258	741WUA0001	SPRING,EARTH	
119	AD301966	752WSA0327	SHIELD,COVER FPC	
120	AD301907	7260000342	SHEET,CAUTION	
121	BZ710039	8995034000	CORD CLIP UL CO.	
122	AE000156	7235630001	SHEET,DVD	
123	AD300135	769WSA0011	WASHER CRT T=0.5	
124	AE000164	774WPA0005	HOLDER,WIRE-2	
125	AE000159	7260000346	SHEET,CRT NO.	
126	AE000733	7230007691	SHEET,JACK	
127	AE000157	724WNA0009	SHEET,PVC	
128	AE000160	752WSA0331	SHIELD,COVER DECK	
129	BZ710671	752WSA0292	SHIELD,AV JACK	
130	AD301962	752WSA0323	DVD,TOP	
131	AE001233	752WSA0360	PLATE,BOTTOM	
132	AD301964	752WSA0324	VCR,TOP	
133	BZ710694	774WPA0002	HOLDER,WIRE	
134	AD301965	712WPB0136	PLATE,TRAY-FRONT	
135	AE000687	7225490128	SHEET,RATING	
136	AD300007	7230006755	SHEET,CAUTION	
137	AE000161	752WSA0337	SHIELD,DVD	
138	AE000162	752WSA0343	HOLDER,VCR	
139	AD301574	744WUA0013	SPRING,EARTH	
140	BZ710618	755WPAA012	PLATE,COVER LIGHT (L)	
141	AD300758	899EFBA001	WIRING CLIP	
201	AD302054	8141J50C54	SCREW,TAP TITE(P) GW22	5x35
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710320	8117540804	SCREW,TAPPING(B0) TRUSS	4x8
204	BZ710582	8109130B94	SCREW,TAP TITE(B) R PAN	3x29
205	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
206	BZ710562	8109I30804	SCREW,TAP TITE(B) WH7	3x8
207	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
208	BZ710678	8109230804	SCREW,TAP TITE(B) BIND	3x8
209	BZ710409	8107630B04	SCREW,TAP TITE(S) BRAZIER	3x20

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
210	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
211	AD301968	8107230404	SCREW,TAP TITE(S) BIND	3x4
212	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
213	BZ710240	8107230804	SCREW,TAP TITE(S) BIND	3x8
214	BZ710337	8107930604	SCREW,CUP(S)	3x6
---	AE000688	7230007710	SHEET,BAR CODE	
---	AE000010	791WHA0085	LAMIFILM,BAG	
---	BZ710679	792WHA0352	PACKAGE,TOP	
---	AE000524	792WHA0473	PACKAGE,BOTTOM	
---	AE000228	793WCD1492	GIFT BOX	
---	AD301971	A5F101H975	INSTRUCTION BOOK KIT	
---	AD302404	J5500817	REGISTRATION CARD	
---	AE000701	J5F10101C	INSTRUCTION BOOK	
---	AD302406	JB5UD200	POLYBAG,INSTRUCTION(RED CAUTION)	

CHASSIS REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
	300	AE000689	A5I501A420A	DECK ASS'Y	A5I501A420A
	301	BZ710564	85OA400234	PINCH ROLLER BLOCK	
	302	BZ710682	85OA500026	AHC ASS'Y	
	303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
	304	BZ710515	85OP600581	WORM	
	305	BZ710094	85OP500083	BASE,AC HEAD	
	306	BZ710112	85OP800324	SPRING,AC HEAD	
	307	BZ710516	85OA000459	MAIN CHASSIS ASS'Y	
	308	BZ710517	85OA200089	CLUTCH ASS'Y	
	309	BZ710518	85OA200090	ARM IDLER ASS'Y	
	310	BZ710519	85OA300065	LOADING ARM S UNIT	
	311	BZ710520	85OA300066	LOADING ARM T UNIT	
	312	BZ710521	85OA400223	INCLINED BASE T UINT 3S	
	313	BZ710522	85OA400232	P5 ARM ASS'Y 2	
	314	BZ710650	85OA400235	TENSION ARM ASS'Y 2	
	315	BZ710524	85OA400231	INCLINED BASE S UNIT	
	316	AE000442	85OP800367	SPRING,LOCKER	
	317	BZ710526	85OP900736	CASS,HOLDER	
	318	BZ710527	85OP900748	CASS,SIDE L	
	319	BZ710528	85OP900749	CASS,SIDE R	
	320	BZ710529	85OP900739	LOCKER,R	
	321	BZ710530	85OA900228	LINK UNIT	
	322	BZ710531	85OP000496	POST,CASS GUIDE	
	323	BZ710532	85OP200316	REEL,S (S)	
	324	BZ710533	85OP200317	REEL,T (S)	
	325	BZ710534	85OP200308	GEAR,IDLER	
	326	BZ710535	85OP200311	GEAR,CLUTCH	
	327	BZ710536	85OP200312	GEAR,COUPLING	
	328	BZ710537	85OP200313	LEVER,CLUTCH	
	329	BZ710538	85OP300194	GEAR,MAIN LOADING	
	330	BZ710092	85OP400490	LEVER,TENSION	
	331	BZ710093	85OP400492	HOLDER,TENSION	
	332	BZ710366	85OP400520	CAP.P4	
	333	BZ710762	85OP400542	BAND,TENSION	
	334	BZ710540	85OP400533	CONNECT,TENSION	
	335	BZ710541	85OP600573	ARM,BRAKE T	
	336	BZ710763	85OP600584	BAND,BRAKE T	
	337	BZ710543	85OP600577	CAM,PINCH ROLLER	
	338	BZ710544	85OP600578	CAM,MAIN	
	339	BZ710545	85OP600579	ROD,MAIN	
	340	BZ710546	85OP600582	GEAR,JOINT	
	341	BZ710110	85OP800322	SPRING,TENSION	
	342	BZ710547	85OP800360	SPRING,BRAKE T	
	343	BZ710548	85OP800355	SPRING,COUPLING	
	344	BZ710549	85OP800356	SPRING,RING	
	345	BZ710565	85OP900750	LEVER,LINK 2	
	346	BZ710551	85OP900744	LEVER,FLAP	
	347	BZ710552	85OP900745	CASS,OPENER	
	348	BZ710106	85OP700035	REFLECTOR,LED	
	349	BZ710514	85OP900746	BRACKET,TOP 3V	
	501	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
	502	BZ710058	83ETW30000	E-RING	3.0
	503	BZ710371	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
	504	BZ710046	8102120604	SCREW,PAN	M2x6
	505	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
	506	BZ710553	810A130404	SCREW/WASHER(A)	M3x4
	507	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
	508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
	509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
	510	BZ710017	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
	CD1501	BZ614292	122H071704	CORD JUMPER	2H071704
	CD1502	AD301953	122Y021002	CORD JUMPER	2Y021002
	H5001	AD301675	1523Q91003	HEAD (AUDIO CONTROL)	VTR-1X2RPE22-756
	H5002	AD301676	1543Q02014	HEAD (FULL ERASE)	VTR-1X2ERS11-154
⚠	M101	BZ710566	1596P98001	MOTOR (LOADING)	MXN13FB12K3
⚠	M2001	AD301677	1510S98038	CAPSTAN DD UNIT	F2QVB33
	M2003	BZ710657	1589S11017	MICRO MOTOR	I2OAL05
⚠	UN4001	AE000690	A5I501G500	CYLINDER UNIT ASS'Y	A5I501G500

DVD DECK REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
600	AE000167	A5F101H650	DVD MECHA ASS'Y	A5F101H650
601	AD301822	92P100022A	TRAVERSE HOLDER	
602	AD301823	92P100032A	RACK,FEED 1	
603	AD301824	92P100033A	RACK,FEED 2	
604	AD301825	92P100035A	LEVER,RACK FEED	
605	AD301826	92P200006A	INSULATOR(F)	
606	AD301827	92P200007A	INSULATOR(R)	
607	AD301850	92P300008A	SPRING,CHASSIS	
608	AD301849	92P300005A	SPRING,ARM IDLER	
609	AD301830	92P300006A	SPRING,RACK FEED 2	
610	AD301831	92P300007A	SPRING,RACK FEED 1	
611	AD301848	92P100031A	ARM,IDLER	
612	AD301833	92P000001A	CLAMPER PLATE	
613	AD301834	92P100019A	RACK,LOADING	
614	AD301835	92P100020A	MAIN FRAME M	
615	AD301836	92P100021A	TRAY	
616	AD301837	92P100023A	GEAR,MAIN	
617	AD301838	92P100024A	CLAMPER	
618	AD301839	92P300002A	SPRING,RACK LOADING	
619	AD301840	92P400002A	MAGNET,CLAMPER	
620	AD301847	92P100030A	GEAR,IDLER	
621	AD301842	92P100025A	GEAR,MOTOR	
622	AD301843	92P100026A	GEAR,MIDDLE 1	
623	AD301844	92P100027A	GEAR,MIDDLE 2	
624	AD301845	92P100028A	GEAR,MIDDLE 3	
625	AD301846	92P100029A	GEAR,FEED	
626	AE001179	92P300009A	SPRING,RACK L	
701	BZ710187	8110226804	SCREW,TAP TITE(P) BIND	2.6x8
702	AD301851	8110120604	SCREW,TAP TITE(P) PAN	2x6
703	AD301852	8107220504	SCREW,TAP TITE(S) BIND	2x5
704	AD301853	8140117254	SCREW,PAN	M1.7x2.5 P3
705	AD301913	8110220804	SCREW,TAP TITE(P) BIND	2x8
CD2001	AD301855	122H0O1901	CORD JUMPER	2H0O1901
CD2301	AD301856	122H080701	CORD JUMPER	2H080701
CD2302	AE000148	06CH232101	CORD CONNECTOR	CH232101
CP1	AD301858	069JV80180	CONNECTOR PCB SIDE	IMSA-9615S-08C-PP
⚠ M2002	AD301861	1515S98001	FEED MOTOR	BCD3B81
PCB640	AD301862	A5E601V640	PCB ASS'Y	VEBA17A
PCB68A	AD301863	A5E601V680	PCB ASS'Y	VEBA12A
SW1	AD301866	0515S32001	SWITCH	SSS-23-6
SW2	AD301867	0500S01032	PUSH LEVER SWITCH	SW1AB-271-10A

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
			RESISTORS		
⚠R401	AD300036	R4X5T6562F	R,METAL	5.6K OHM 1/6W	
⚠R403	AD300037	R4X5T6153F	R,METAL	15K OHM 1/6W	
⚠R405	AD300037	R4X5T6153F	R,METAL	15K OHM 1/6W	
⚠R406	AD302023	R3X28A181J	R,METAL	180 OHM 2W	
⚠R412	BZ210021	R65582680J	R,FUSE	68 OHM 1/2W	
⚠R417	AD302023	R3X28A181J	R,METAL	180 OHM 2W	
⚠R423	BZ210051	R3X18AR47J	R,METAL OXIDE	0.47 OHM 2W	
⚠R429	BZ210150	R002T2010J	RC	1 OHM 1/2W	
⚠R430	AD301920	R5X34F2R7J	R,CEMENT	0 2.7 OHM 10W	
⚠R440	AD301921	R5X34F332J	R,CEMENT	0 3.3K OHM 10W	
⚠R445	BZ210104	R6558A2R7J	R,FUSE	2.7 OHM 2W	
R449	AE000145	R002T2561J	RC	560 OHM 1/2W	
⚠R454	AE000676	R3K181102J	R,METAL	1K OHM 1W	
⚠R814	BZ210026	R3X18A153J	R,METAL OXIDE	15K OHM 2W	
⚠R815	BZ210026	R3X18A153J	R,METAL OXIDE	15K OHM 2W	
⚠R816	BZ210026	R3X18A153J	R,METAL OXIDE	15K OHM 2W	
⚠R1701	BZ210206	R002T2155J	RC	1.5M OHM 1/2W	
⚠R1702	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W	
⚠R1706	AD300651	R002T4272J	RC	2.7K OHM 1/4W	
⚠R1714	AD301017	R3X181R15J	R,METAL OXIDE	0.15 OHM 1W	
⚠R1717	AD301016	R3X28A331J	R,METAL OXIDE	330 OHM 2W	
⚠R1718	BZ210250	R5Y2CE1R2J	R,CEMENT	1.2 OHM 7W	
⚠R1720	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W	
R3010	AD302206	R3X181180J	R,METAL OXIDE	18 OHM 1W	
R3021	AE000147	R3X181220J	R,METAL OXIDE	22 OHM 1W	
			CAPACITORS		
C005	AD300413	E02LT0102M	CE	1000 UF 6.3V	
C321	BZ210176	E02LF3222M	CE	2200 UF 25V	
⚠C403	BZ110195	E02LU8220M	CE	22 UF 100V	
C404	BZ110023	E62DFB470M	CE	47 UF 160V	
⚠C408	BZ210157	P4N8FJ562H	CMPP	0.0056UF 1.25KV	
C412	BZ110136	P4J7F3394J	CMPP	0.39 UF 250V PMS	
⚠C418	BZ210161	P4N8FJ682H	CMPP	0.0068UF 1.25KV	
⚠C429	AD301434	E02LU4101M	CE	100 UF 35V	
⚠C430	BZ110101	E5EZF3222M	CE	2200 UF 25V	
⚠C434	BZ110055	E5EZF4102M	CE	1000 UF 35V	
⚠C446	AD300061	E5EZFD220M	CE	22 UF 250V	
C449	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R	or
	BZ110182	C03L0R713K	CC	0.001 UF 2KV R	
C801	BZ110166	CQGTCH412J	CC	100 PF 50V CH	
C820	AD300078	C0JBB0713K	CC	0.001 UF 2KV B	
⚠C1701	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL	
C1705	AE000699	C0PLRR7S2K	CC	560 PF 2KV R	
C1707	BZ110203	C0PLRR7W2K	CC	820 PF 2KV R	or
	BZ110183	C03L0R7W2K	CC	820 PF 2KV R	
⚠C1708	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B	
⚠C1710	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B	
⚠C1711	AD301391	CD39E0MQ3M	CC	0.0047UF 250V	
⚠C1714	AE000700	E52DHC681M	CE	680 UF 200V	or
	AE000142	E52DHC681S	CE	680 UF 200V	
⚠C1716	BZ110010	E02L03222M	CE	2200 UF 25V	
⚠C1717	BZ110055	E5EZF4102M	CE	1000 UF 35V	
⚠C1720	AD301025	E62NFB221M	CE	220 UF 160V	
⚠C1728	AD300785	E02LT1222M	CE	2200 UF 10V	
C1729	AE000699	C0PLRR7S2K	CC	560 PF 2KV R	
⚠C1732	BZ110078	E02L03102M	CE	1000 UF 25V	
C3009	AD300413	E02LT0102M	CE	1000 UF 6.3V	
			DIODES		
D101	AD301638	0010E00330	INFRARED LED	LTE-3271T-012A-O	
D102	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D103	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
D105	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D106	AD300670	D97U01501B	DIODE,ZENER	MTZJ15B T-77	
D108	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
⚠D402	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	
D403	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
D404	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77	
⚠D408	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
D410	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC	
D411	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77	
⚠D412	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC	
D413	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			DIODES	
D414	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
⚠D415	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D416	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
D417	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D418	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D419	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D601	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D602	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D603	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D605	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D804	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D805	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D806	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1702	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1703	AE000141	D97U02R71B	DIODE,ZENER	MTZJ2.7B T-77
⚠D1704	BZ410007	D23TGP15J0	DIODE,SILICON	RGP15J-G23
⚠D1705	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D1706	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D1707	BZ410007	D23TGP15J0	DIODE,SILICON	RGP15J-G23
D1709	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1710	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D1711	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D1712	BZ410067	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
⚠D1713	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D1715	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D1716	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D1717	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D1718	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D1719	BZ410115	D2LKB340L0	DIODE,SCHOTTKY	SB340L-6737
D1720	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1721	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1722	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D1723	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D1724	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1726	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1727	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D1728	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1730	AD301980	D2CF2016L0	DIODE,SILICON	FE201-6L49
D1732	AD300070	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D1733	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1734	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D2001	BZ410120	DDARDS1210	DIODE,SILICON	KDS121RTK
D2002	BZ410121	DDARDS1200	DIODE,SILICON	KDS120RTK
D2201	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D2205	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D2206	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D2207	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D3001	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D3002	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D3003	BZ410090	D97U04R71B	DIODE,ZENER	MTZJ4.7B T-77
D3004	BZ410077	D2WXSB1400	DIODE,SCHOTTKY	SB140-EIC
D3005	BZ410012	D28TQS04N0	DIODE,SCHOTTKY	11EQS04N-TA1B2
D3007	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D3008	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D3011	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D4201	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D4204	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D4205	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D4207	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D5501	BZ410012	D28TQS04N0	DIODE,SCHOTTKY	11EQS04N-TA1B2
D5502	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D8501	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8502	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8503	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8504	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8505	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8506	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148
D8510	BZ410119	DDDRL41480	DIODE,SILICON	MCL4148

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
			ICS		
IC101	AD301923	I51F58074A	IC	OEC8074A	
IC103	AD301641	I9UF032310	IC	PST3231NR	
IC199	AE000692	A5I502A015	IC	S-24C04BDP-LA	
IC302	AD301983	I01FF58910	IC	AN5891SA-E1V	
⚠IC352	AD302184	I0FSP7522N	IC	AN7522N	
⚠IC401	BZ611025	I03TD80400	IC	LA78040	
IC601	AD301765	I03FC63190	IC	LA76319M-MPB-E	
IC602	AE000143	I1KF98L100	IC	KIA78L10F-RTF	
IC1501	AD300609	I05FE90A45	IC	TC90A45F	
IC1502	AD301988	I0UF015010	IC	MM1501XNRE	
IC1504	AD301988	I0UF015010	IC	MM1501XNRE	
IC1505	AD301927	I0UF015040	IC	MM1504XNRE	
⚠IC1701	AD301771	000220001W	PHOTO COUPLER	PS2561L1-1-V(W)	
⚠IC1702	AD302211	I1KJ9A431A	IC	KIA431A-AT	
IC2001	AD302391	I5PKL63160	IC	STM6316ATXXZ	
IC2301	BZ611126	I03F065600	IC	LA6560	
IC2303	AD301770	I07E00358F	IC	BA10358F-E2	
IC2304	AD301770	I07E00358F	IC	BA10358F-E2	
⚠IC3001	AD301931	I1KA78R050	IC	KIA278R05PI	
⚠IC3002	AD301929	I1KA78R090	IC	KIA278R09PI	
⚠IC3003	AD301931	I1KA78R050	IC	KIA278R05PI	
IC3004	AD301931	I1KA78R050	IC	KIA278R05PI	
IC4002	AD302392	I5PK055890	IC	STM5589AVA	
IC4003	AD301774	I5CF0CU040	IC	SN74AHCU04PWR	
IC4007	AE000526	IF8J064007	IC	IS42S16400-7T	
IC4012	AE000527	I5PJ060ET9	IC	M29W160ET90N6	
IC4501	BZ611095	I03F3205M0	IC	LA71205M-MPB	
IC5501	BZ611114	I01F63FBP0	IC	AN3663FBP	
IC8001	AD301988	I0UF015010	IC	MM1501XNRE	
IC8002	AD301988	I0UF015010	IC	MM1501XNRE	
IC8004	BZ611074	I0QF045800	IC	NJM4580M	or
	AE001295	I0QJ045800	IC	NJM4580M(TE1)	
IC8501	BZ611130	I0GF9XZ010	IC	PQ070XZ01ZP	
IC8502	AD301777	I17F0742K0	IC	PCM1742KE/2K	
IC8504	BZ611130	I0GF9XZ010	IC	PQ070XZ01ZP	
			TRANSISTORS		
Q101	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L	
Q102	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146	or
	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q103	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L	
Q104	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N	
Q105	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N	
Q106	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146	or
	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q107	BZ410107	0002700690	PHOTO COUPLER	RPI-303	
Q108	BZ410107	0002700690	PHOTO COUPLER	RPI-303	
Q110	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q114	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q116	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q350	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q401	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT	
⚠Q403	BZ510040	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)	
⚠Q406	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA	
Q407	BZ510096	TNATB03005	COMPOUND TRANSISTOR	KRC102MAT	
Q408	AD300674	TCAT032070	TRANSISTOR,SILICON	KTC3207-AT	
Q409	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA	
Q601	BZ510039	TNYTB05001	COMPOUND TRANSISTOR	DTC114EKT147	
Q602	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q605	BZ510025	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146	or
	BZ510090	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK	
Q606	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q802	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	
⚠Q803	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT	
⚠Q804	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	
⚠Q805	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT	
⚠Q806	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)	
⚠Q807	AD301032	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT	
Q1501	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q1502	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q1503	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q1702	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
			TRANSISTORS		
⚠Q1705	BZ510098	T220033260	FET	2SK3326(2)	
⚠Q1706	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT	
Q2001	BZ510112	T67J1036K0	TRANSISTOR,SILICON	2SA1036KT146	
Q2002	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q2003	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q2004	BZ510113	T27T030180	FET	2SK3018	
Q2005	BZ510113	T27T030180	FET	2SK3018	
Q2006	BZ510112	T67J1036K0	TRANSISTOR,SILICON	2SA1036KT146	
Q2007	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q2008	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q2201	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q2202	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q2203	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q2301	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q2302	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q2303	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q2304	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q2305	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q3001	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q3002	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT	
⚠Q3003	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT	
Q3004	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q3005	AD301934	TBA0013660	TRANSISTOR,SILICON	KTB1366(O,Y)	
⚠Q3006	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q3007	BZ510057	TAAT01281Y	TRANSISTOR,SILICON	KTA1281_Y	
Q3008	BZ510081	TPYJA05001	COMPOUND TRANSISTOR	DTA143EKAT146	or
	BZ510107	TPAAA05001	COMPOUND TRANSISTOR	KRA101SRTK	
Q3009	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146	or
	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK	
Q3010	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT	
Q3011	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
⚠Q3014	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT	
Q3015	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4001	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q4002	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q4003	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q4201	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4202	BZ510026	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146	or
	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK	
Q4203	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4204	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146	or
	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK	
Q4210	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4211	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4212	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4501	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q4502	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
Q4503	BZ510026	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146	or
	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK	
Q4504	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT	
Q4505	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)	
Q4506	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4507	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q4509	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q4511	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S	
Q8002	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q8006	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S	
Q8007	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146	or
	BZ510067	TNAAC05002	COMPOUND TRANSISTOR		
Q8501	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q8502	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q8503	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK	
Q8505	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK	
			COILS &TRANSFORMERS		
L001	BZ310001	021673101J	COIL	100 UH	
L301	BZ310005	02167D101K	COIL	100 UH	
L402	BZ310063	022100027A	COIL,LINEARITY	ELH5L4113	
L403	BZ310004	021679472K	COIL	4.7 MH	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		COILS &TRANSFORMERS		
L601	BZ310041	02167F101J	COIL	100 UH
L602	BZ310005	02167D101K	COIL	100 UH
L603	BZ310118	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L804	BZ310005	02167D101K	COIL	100 UH
L1501	AD300612	02167F100J	COIL	10 UH
L1502	BZ310161	0216A6150K	COIL	15 UH
L1504	AD300123	021673151K	COIL	150 UH
L1505	BZ310201	0216A6101K	COIL	100 UH
L1506	BZ310201	0216A6101K	COIL	100 UH
⚠L1701	BZ310180	029T000105	COIL,LINE FILTER	2R2A752F28
⚠L1703	BZ310066	028R200024	COIL,DEGAUSS	8R200024
L1704	BZ310181	02A6B2E0A1	CORE,FERRITE	HF70T22*10*14
L2001	AE000529	0216S4100J	COIL	10 UH
L2002	AE000529	0216S4100J	COIL	10 UH
L2004	AE000095	02167F2R7J	COIL	2.7 UH
L3001	AD301785	02167E100K	COIL	10 UH
L3002	AD301785	02167E100K	COIL	10 UH
L4001	BZ310039	02167F220J	COIL	22 UH
L4002	BZ310039	02167F220J	COIL	22 UH
L4003	BZ310039	02167F220J	COIL	22 UH
L4004	BZ310039	02167F220J	COIL	22 UH
L4205	BZ310041	02167F101J	COIL	100 UH
L4502	BZ310114	031626009R	COIL,BIAS OSC	1626009
L4504	BZ310041	02167F101J	COIL	100 UH
L4505	BZ310040	02167F470J	COIL	47 UH
L4506	BZ310040	02167F470J	COIL	47 UH
L4509	BZ310005	02167D101K	COIL	100 UH
L5501	BZ310201	0216A6101K	COIL	100 UH
L5502	BZ310039	02167F220J	COIL	22 UH
L5503	BZ310039	02167F220J	COIL	22 UH
L5504	BZ310039	02167F220J	COIL	22 UH
L8001	BZ310041	02167F101J	COIL	100 UH
L8002	BZ310201	0216A6101K	COIL	100 UH
L8003	BZ310041	02167F101J	COIL	100 UH
L8501	BZ310191	02167F2R2J	COIL	2.2 UH
L8502	BZ310191	02167F2R2J	COIL	2.2 UH
L8503	BZ310191	02167F2R2J	COIL	2.2 UH
L8504	BZ310118	02AHB9A972	CORE,FERRITE	W5T29X7.5X19
L8507	BZ310191	02167F2R2J	COIL	2.2 UH
L8509	BZ310191	02167F2R2J	COIL	2.2 UH
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRIVE	ETH14Y47AY
⚠T1701	AD301935	048142065S	TRANSFORMER,SWITCHING	8142065S
		JACKS		
⚠J801	AD301936	066F130021	SOCKET,CATHODE RAY,TUBE	ISHS62S
⚠J2201	BZ614361	060J131015	HEADPHONE JACK	MSJ-2000
J2202	BZ614146	060G421016	RCA JACK	HTJ-032-05AY
J2203	BZ614147	060G421017	RCA JACK	HTJ-032-05AW
J2204	BZ614280	060G421020	RCA JACK	HTJ-032-05AR
J4201	AD301038	060J431019	RCA JACK	MSP-213V2-432 PBSN
J4202	BZ614399	060J411018	RCA JACK	MSP-213V1-432 PBSN
J8007	BZ614400	060J401082	RCA JACK	MSP-251V-05PBSN
		SWITCHES		
SW101	BZ612016	0508S11001	SWITCH (LEAF)	LSA-1144EAU
SW2201	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2202	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2203	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2204	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2205	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2206	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2207	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2251	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2252	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2253	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2254	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2255	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2256	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2257	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2258	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
		VARIABLE RESISTORS		
VR404	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
⚠VR1701	AD301937	V1K6314BTE	VOLUME,SEMI FIXED	NVG6TLTAB103

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		P.C.BOARD ASSEMBLIES		
PCB010	AE000691	A5I502A010	PCB ASS'Y	VMC293B
PCB080	AE000693	A5I502A080	PCB ASS'Y	TMC564B
PCB110	AE000694	A5I502A110	PCB ASS'Y	TCC426B
PCB130	AE000695	A5I502A130	PCB ASS'Y	VMC297A
PCB270	AE000696	A5I502A270	PCB ASS'Y	TECB10B
		MISCELLANEOUS		
B401	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B402	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B403	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B1703	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B2001	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B2002	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B2003	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B2004	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B2005	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B2201	BZ310129	024HT03564	CORE,BEADS	W4BRH3.5X6X1.0
B2301	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B4002	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B4004	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B8001	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B8501	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B8502	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B8503	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04
B8505	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
BL001	BZ310014	023C00022A	COIL,BALUN	HPN-01
BT001	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
BT002	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
CD002	BZ614411	06CU011902	CORD,CONNECTOR	CU011902
CD303	BZ614424	06CU149001	CORD,CONNECTOR	CU149001
CD602	AD302218	06CU291701	CORD,CONNECTOR	CU291701
CD603	AE000133	06CU284501	CORD,CONNECTOR	CU284501
CD604	AE000132	06CU282401	CORD,CONNECTOR	CU282401
CD802	BZ614310	WCL6844038	FLAT CABLE	AWM2468 AWG26 5C GRAY 440MM
CD803	BZ614378	06CU823001	CORD,CONNECTOR	CU823001
CD805	BZ614378	06CU823001	CORD,CONNECTOR	CU823001
CP001	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP101	BZ614289	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
CP303	AD301045	069S140419	CONNECTOR PCB SIDE	A2502WV2-4P
⚠CP404	BZ614303	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P
CP601	AD301943	069S240639	CONNECTOR PCB SIDE	A2001WR2-4P
CP602	BZ614462	067U009039	WIRE HOLDER	B2013H02-9P
CP603	AD301944	067U008029	WIRE HOLDER	B2013H02-8P
CP604	AD301796	069S280629	CONNECTOR PCB SIDE	A2001WV2-8P
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP805	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
⚠CD1702	BZ614407	120R415906	CORD,AC BUSH	0R415906
CD2251	BZ614408	06CU220701	CORD,CONNECTOR	CU220701
CD4501	BZ614373	122F061502	CORD,JUMPER	2F061502
CD8501	AE000134	122H0C2204	CORD,JUMPER	2H0C2204
CD8505	AD301946	06CU2B3301	CORD,CONNECTOR	CU2B3301
CP1702	AD301944	067U008029	WIRE HOLDER	B2013H02-8P
⚠CP1704	AD300687	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP1707	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP1708	BZ614444	069D01001A	CONNECTOR PCB SIDE	003P-2100
CP2001	AD302396	069JYOT099	CONNECTOR PCB SIDE	IMSA-9631S-24Y901
CP2201	BZ614416	069S220629	CONNECTOR PCB SIDE	A2001WV2-2P
CP2301	AD301858	069JV80180	CONNECTOR PCB SIDE	IMSA-9615S-08C-PP
CP2302	AD301795	069S230639	CONNECTOR PCB SIDE	A2001WR2-3P
CP4501	BZ614011	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1
CP4502	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14
CP4503	AD301649	067U002019	WIRE HOLDER	B2013H02-2P
CP602B	BZ614458	069S290629	CONNECTOR PCB SIDE	A2001WV2-9P
CP603B	AD301796	069S280629	CONNECTOR PCB SIDE	A2001WV2-8P
CP8001	BZ614214	069S2B0629	CONNECTOR PCB SIDE	A2001WV2-11P
CP8002	AD301797	069J7C0029	CONNECTOR PCB SIDE	IMSA-9604S-12Z14
CP802A	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP802B	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P
CP8502	AD301798	069J7C0019	CONNECTOR PCB SIDE	IMSA-9604S-12Z13
CUS011	BZ710148	800WFAA007	CUSHION B	
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD
EL003	BZ614044	124120301A	EYE LET	XRY20X30BD

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			MISCELLANEOUS	
EL004	BZ614043	124116281A	EYE LET	XRY16X28BD
⚠F1701	AD301046	081PC6R305	FUSE	51MS063L
⚠FB401	AD302038	043220058F	TRANSFORMER,FLYBACK	FJN20A003
FH1701	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH1702	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
OS2201	AD301949	0773071003	REMOTE RECEIVER	RPM7138-SH10
⚠RY1701	AD300114	0560V20115	RELAY	ALKS321
⚠SP351	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠SP352	BZ614381	070C546004	SPEAKER	SG04H02BRA
TM101	AD301950	076D0FG020	TRANSMITTER	ORV201N36010
⚠TU001	AE000273	0163300005	RF UNIT	115-V-K015AR_B
⚠TH1701	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
⚠V801	AD302039	098Q210448	CRT W/DY	A51AKL13X04
X101	BZ613006	100DA32R01	CRYSTAL	DT-26
X102	BZ613033	100CT01403	CRYSTAL	HC-49/U-S
X601	AD301951	100CT3R532	CRYSTAL	HC-49/U-S
X2001	AD301802	100BT02003	CRYSTAL	HC-49U/S
X4001	AD301803	100BT02701	CRYSTAL	HC-49U/S
X4501	BZ613017	100CT3R502	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN